P
352.05
A512
v. 18
Ja. - Je. 1918

116343

From the collection of the

Prelinger Library

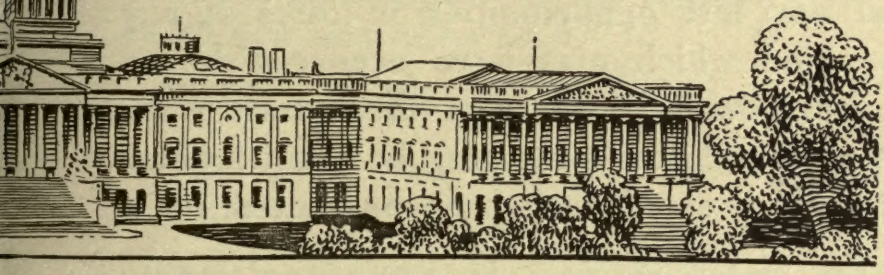
San Francisco, California
2007

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/americancity18granrich

39

installation of
ON PIPE
to 15 inaugurations



Prior to 1857 the problems of water supply and sanitation faced by the officials of our Capitol City were great and pressing.

During that year several miles of cast iron pipe were laid. This mileage has been gradually increased until the water and gas supply is now carried through more than one thousand miles.

The city's heads learned from that first installation what an eminent authority on aqueducts has so aptly said—"In cast iron you are dealing with a certainty."

Publicity Bureau
New York City

1917

As you look back over the year 1917 and recall any lost opportunities or losses of any other kind which may have occurred during the year, don't forget that there may have been serious losses sustained by your municipality which could have been prevented.

If the water services in your municipality are not fully metered, there has been a great deal of unnecessary water waste.

This may seem like a small thing to you in any individual case—but in the aggregate, the loss is tremendous.

The remedy is water meters—*accurate* water meters,—*Trident* water meters.

Why not write us today for our free booklets about water waste prevention.

NEPTUNE METER COMPANY

50 EAST 42nd STREET, NEW YORK

CHICAGO · BOSTON · CINCINNATI · SANFRANCISCO
ATLANTA · LOS ANGELES · PORTLAND · SEATTLE

1918

The beginning of a new year is the logical time for resolutions. Make at least one good resolution and *stick to it.*

Would you like us to suggest one?

Here goes—and we'll not charge you for it either.

Just resolve that during 1918 you will take steps towards stopping any waste of good water resulting from the out-of-date, inequitable and generally inexcusable flat rate system of selling water.

You know that by installing meters you will save all along the line, so why not do it—at a time when conservation of resources is a national watchword?

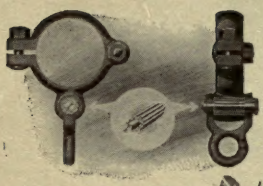
Let us at least have your address so we can send you some interesting booklets about water conservation.

NEPTUNE METER COMPANY

50 EAST 42nd STREET, NEW YORK

CHICAGO · BOSTON · CINCINNATI · SANFRANCISCO
ATLANTA · LOS ANGELES · PORTLAND · SEATTLE

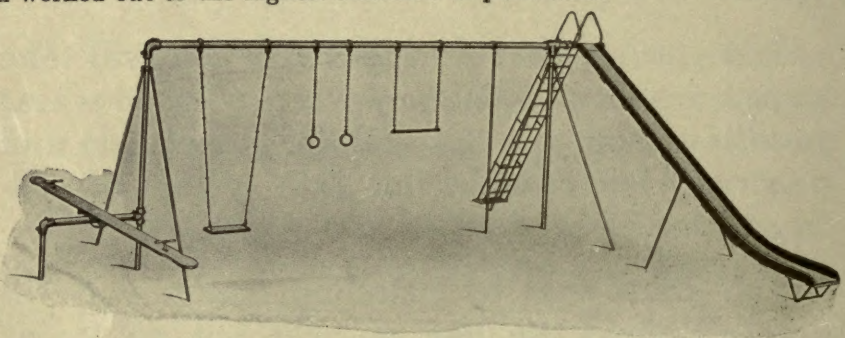
EVERWEAR
STANDS WEAR AND TEAR



Swing as High as You Like

The children are safe on EVERWEAR swings. They are built with an eye single to safety.

An all-steel galvanized product throughout, specially designed for the wear and tear of outdoor use. All detail of bearings, connections, etc., have been worked out to the highest standard of perfection.



COMBINATION OUTFIT, No. E-125. 8 ft. high, 20 ft. long.

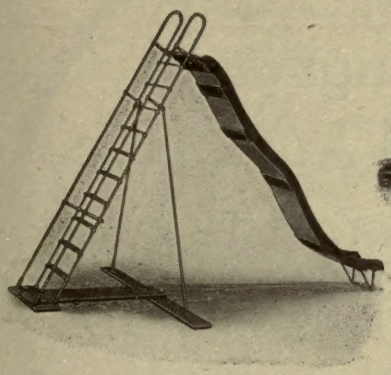
EVERWEAR outfits are equipped with malleable frame fittings and drop forged steel parts for bearings. Combinations of apparatus furnished to suit any locality or condition. Advise us of your ground space, water, shading, etc., and we will be pleased to furnish you plans and prices gratis. Our services are yours for the asking.

A full line of the latest and approved playground apparatus shown in Catalog E-8 which will be sent on request.

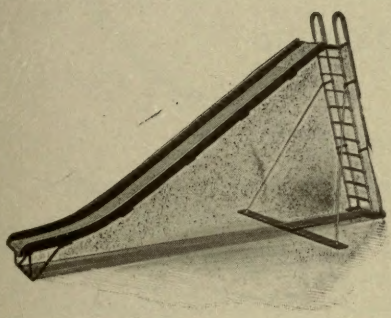
THE EVERWEAR MFG. CO.

Springfield, Ohio

EVERWEAR
STANDS WEAR AND TEAR

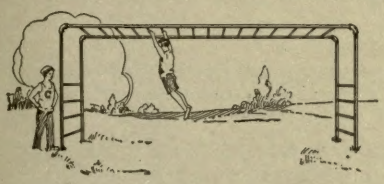


The Old Cellar Door Commercialized



If there is any one piece of playground apparatus that the child likes more than another, that outfit is the slide chute. This is the most popular outfit of all in the minds of the children, and just keep your eye on the "grown-ups" for a slide on the sly.

The bedways of Everwear Chutes are lined with either clear rock maple or heavy galvanized sheet metal—as you elect—the price being the same. The all-steel step approach is equipped with malleable TREAD STEPS and all metal parts are galvanized throughout.



We furnish them in all lengths from the 8-foot Kindergarten length to the 30-foot length for public playgrounds.

Catalog E-8 showing a full line of the latest and approved playground equipment will be sent on request. Send in coupon below.

The Everwear Mfg. Co.
SPRINGFIELD, OHIO

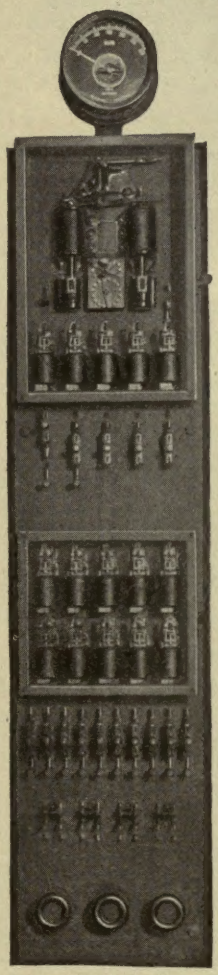
GENTLEMEN:

Please send me without cost, a copy of your Catalog E-8, showing a full line of the latest and approved playground equipment.

Name.....

Address.....

Am. City



Type AN-12 Generator Voltage Regulator for Controlling Three Exciters, Each Connected Directly to a Generator with Generators in Parallel.

Westinghouse Improved Automatic Alternating-Current Voltage Regulators

Maintain Consumers Service At Maximum

Inadequate voltage regulation reduces the quality of service and consequently its commercial value.

Four profitable uses of Westinghouse Alternating-Current Voltage Regulators are:

1. The maintenance of constant voltage at generator bus or some predetermined center of distribution.
2. The maintenance of constant voltage at the end of transmission lines by the control of synchronous condensers or synchronous boosters.
3. The control of booster converters.
4. The control by special regulators of synchronous condensers applied to local network or distributing systems, for voltage regulation and power factor correction.

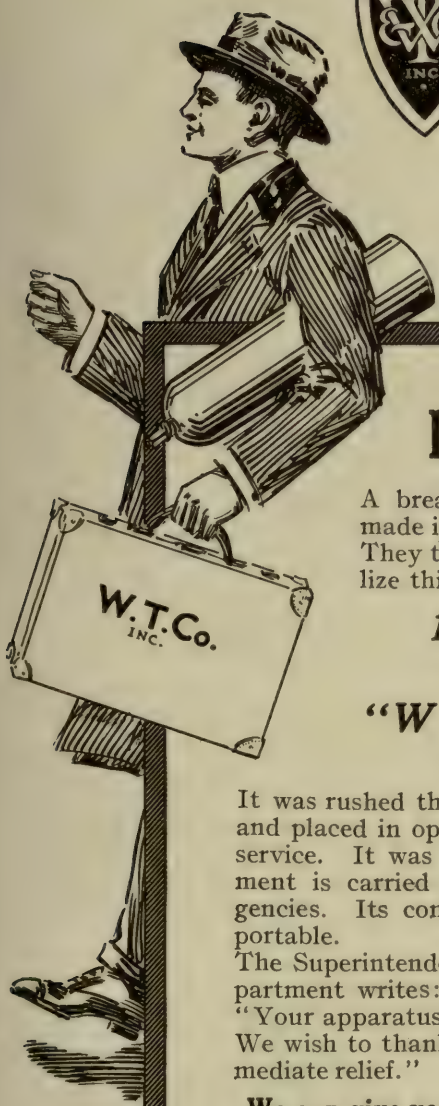
The Voltage Regulators are arranged in suitable cases for bracket, panel or pedestal mounting.—The use of master relays permits the construction of regulators with as many as 60 rheostat-shunting relays. Any size regulator can be designed to be mounted on one or more 16 in. panels.

For full description send for leaflet No. 3822-A

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

Westinghouse

Service is "ready" Service



Lynn Proved It So!

A break in the water-distributing mains made it necessary to use a polluted supply. They telegraphed us for apparatus to sterilize this water, *and make it safe.*

13 hours after Lynn called for help—a "W & T" CHLORINATOR was in service.

It was rushed there by one of our engineers, installed and placed in operation. This is what we call *ready* service. It was possible because "W & T" Equipment is carried in stock *ready* for just such emergencies. Its compact construction makes it easily portable.

The Superintendent of the Lynn (Mass.) Water Department writes:

"Your apparatus performed in a satisfactory manner. We wish to thank you for your efforts to give us immediate relief."

We can give you just as efficient service!

Liquid Chlorine is the most efficient sterilizing agent. *Use* it to purify your Water Supply. *Control* it by "W & T" Equipment—the appartus of unfailing reliability, accuracy and permanency.

REMEMBER, "W & T" service is always *ready* for emergencies.

Wallace & Tiernan Co., Inc.

137 Centre Street, N. Y.

Chicago **San Francisco**

wire or phone

The Meter that gives absolute satisfaction is the BADGER

THE BADGER

Gives Most Service and Least Trouble

The water meter that will keep accurate records and give the most service with little trouble and maintenance expense is the Badger Meter.

Perfect workmanship and excellent finish are characteristic of all Badger Meters.

Every Badger Meter is carefully tested by actual operation before it is sent forth with our binding guarantee for accuracy.

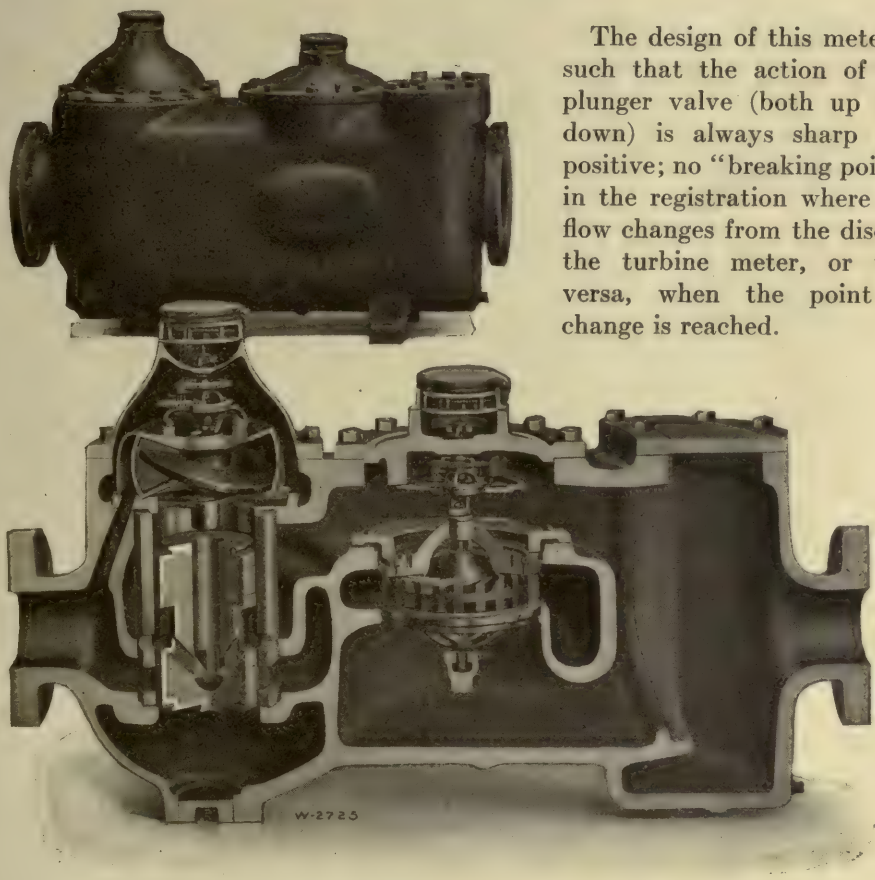
No test is considered satisfactory until the meter has properly recorded on both large and small flows.

Upon receipt of your name and address, a neat little booklet on water meters will be sent you free.

The Badger Meter Mfg. Co.
MILWAUKEE, WIS.

WORTHINGTON

COMPOUND METER



The design of this meter is such that the action of the plunger valve (both up and down) is always sharp and positive; no "breaking point" in the registration where the flow changes from the disc to the turbine meter, or vice versa, when the point of change is reached.

Send for Catalog W809-72

WORTHINGTON PUMP AND MACHINERY CORPORATION

New York Office: 115 Broadway **Works: Harrison, N. J.**

Branch Offices in all Principal Cities

W369.8

Before Paving, Build Sewers

FAR sighted communities plan and install adequate systems of sewerage before streets are paved. As a further guarantee against tearing up pavements, they use

Vitrified Clay Pipe

"THE PERMANENT PIPE"

Superlative hardness and resistance to chemicals make it the most lasting material. Its glazed surface insures maximum capacity and a clean flow. Permanence, capacity and ease of installation make it the most economical sewer. We recommend poured joints exclusively. Write for literature.

THE SEWER PIPE MANUFACTURERS' ASSOCIATION

JOHN L. RICE
FIELD COMMISSIONER

SECOND NATIONAL BLDG
AKRON, OHIO

The Manograph

WATER WORKS DEPARTMENTS are demanding an accurate accounting of the water delivered to the Distribution System.

Our Engineers, under the personal direction of Paul Lanham, in charge of Water Surveys for leakage at Washington, D. C., using THE MANOGRAPH, will accurately account for water consumed, either as legitimate consumption, waste or theft.

The methods pursued are the result of many years experience in investigations of this character and are PRODUCTIVE OF RESULTS.

An outline of methods employed, and an estimate of costs will be furnished, incurring no obligation.

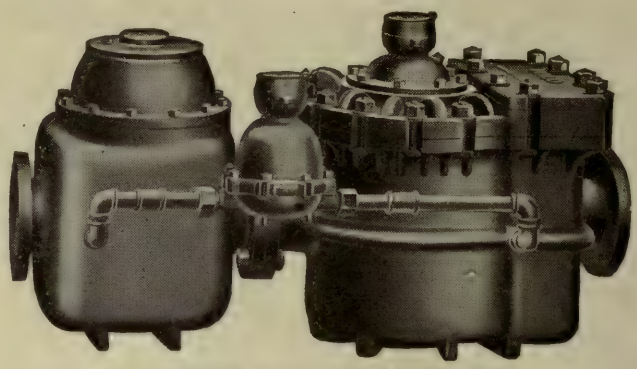
THE MANOGRAPH may be used as a Station Meter, measuring pump discharge, or, delivery through gravity mains.

The testing of large Meters is another valuable service which THE MANOGRAPH is capable of rendering.

Illustrative Descriptive Booklet on request.

WATER WORKS EQUIPMENT COMPANY

50 Church Street **New York City, N. Y.**



Compounding Valve Attached to Nilo Meter

The Union Compounding Valve Makes it Possible for any Large Meter to Register the Trickle as well as the Rush.

Simply take the valve and the small meter and attach them to the large meter, and you have an accurate and simple compound meter at a remarkably low cost.

Look for our exhibit at the New England Water Works Convention.

Write for further information.

UNION WATER METER CO.
WORCESTER, MASS.

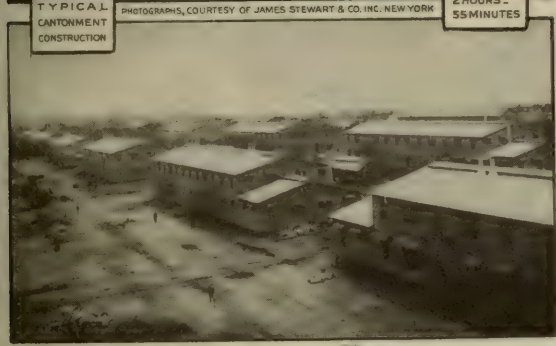
CAST IRON SOIL PIPE
IN GOVERNMENT CANTONMENTS

IN THE BUILDING
UNDER THE GROUND

TYPICAL CANTONMENT CONSTRUCTION

PHOTOGRAPHS, COURTESY OF JAMES STEWART & CO. INC. NEW YORK

TWO-STORY BARRACKS 43X140 FT. BUILT IN 2 HOURS - 55 MINUTES



IN all the National Army Cantonments either now completed or nearing completion

CAST IRON SOIL PIPE

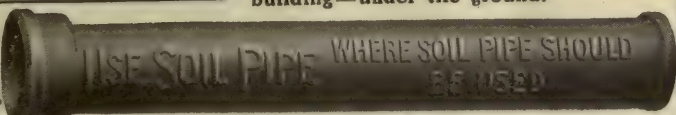
is protecting the health and giving comfort to the boys in khaki.

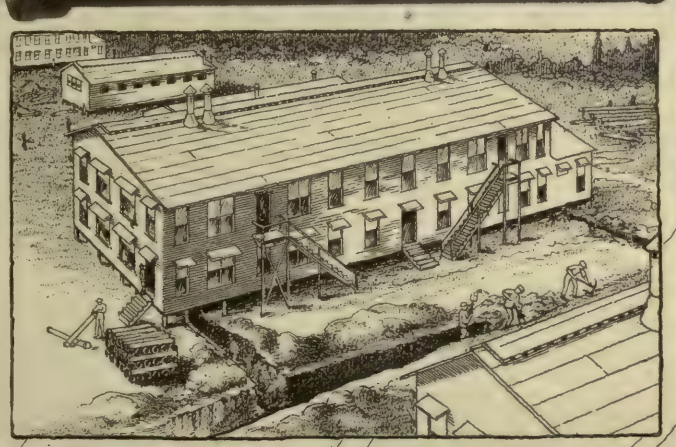
When the plumbing and building drainage of the sixteen huge cantonments was planned substitutes were advocated for cast iron soil pipe, but would not even be considered by the able officials in charge.

Cast Iron Soil Pipe and Fittings for all house drainage has again demonstrated its pre-eminent qualifications as the one efficient and sanitary safeguard against defective plumbing — in the building — under the ground.

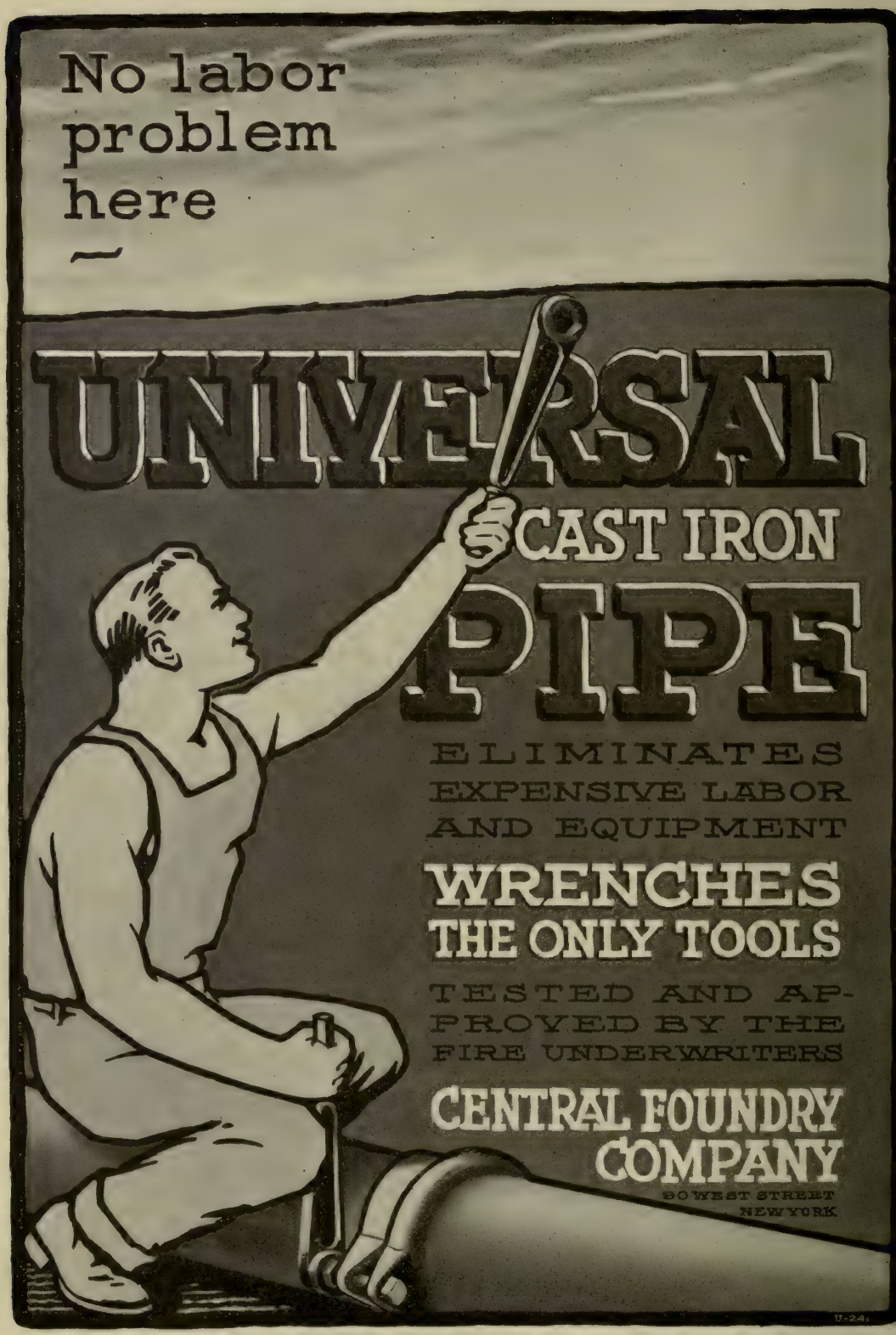
Drop a line today to the nearest Independent and Competing Manufacturer below, for your copy of the handsome book "A Nation-wide Comparison of House Drainage Piping"

Somerville Iron Works	New York, N. Y.
Standard Foundry Co.	Anniston, Ala.
Superior Mfg. Co.	Bessemer, Ala.
Union Foundry Co.	Anniston, Ala.
Weiskittel & Son Co., A.	Baltimore, Md.
Wetter Mfg. Co., H.	Memphis, Tenn.
Abendroth Brothers	Port Chester, N. Y.
Alabama Pipe & Foundry Co.	Anniston, Ala.
American Foundry & Pipe Co.	Penna Sta., Pa.
Anniston Foundry Co.	Anniston, Ala.
Bessemer Soil Pipe Co.	Bessemer, Ala.
Campbell Mfg. Co.	Gadsden, Ala.
Casey-Hedges Co., The	Chattanooga, Tenn.
Central Foundry Co.	New York, N. Y.
Charlotte Pipe & Foundry Co.	Charlotte, N. C.
Cosco Pipe & Foundry Co.	Birmingham, Ala.
Crown Pipe & Foundry Co.	Jackson, Ohio
Gadsden Pipe Co.	Gadsden, Ala.
Haines, Jones & Cadbury Co.	Philadelphia, Pa.
Johnson Co., J. D.	New York, N. Y.
Krupp Foundry Co.	Lansdale, Pa.
Medina Foundry Co.	Medina, N. Y.
National Foundry Co. of N. Y., Inc.,	Brooklyn, N. Y.
National Pipe & Foundry Co.	Attalla, Ala.
Reading Foundry & Supply Co.	Reading, Pa.
Salem Brass & Iron Mfg. Co.	Salem, N. J.
Sanitary Co. of America	Linfield, Pa.





A-1037


No labor
problem
here
UNIVERSAL
CAST IRON
PIPE
ELIMINATES
EXPENSIVE LABOR
AND EQUIPMENT
WRENCHES
THE ONLY TOOLS
TESTED AND AP-
PROVED BY THE
FIRE UNDERWRITERS
CENTRAL FOUNDRY
COMPANY
90 WEST STREET
NEW YORK
U-241

600,000,000 Gallons of

PURE WATER

is now supplied to 160 municipalities, and in no way can it be had more surely and at the same time so economically as by the use of

PITTSBURGH FILTERS

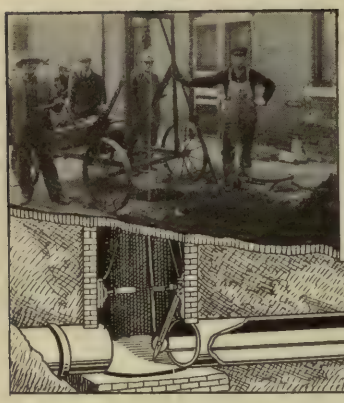
Installations now being made in far off Manchuria and Uraguay, S. A., illustrate the spread of their name and fame. We design and build to meet individual conditions.

Write for more information

PITTSBURGH FILTER MFG. CO.

PITTSBURGH, PA.

CHICAGO KANSAS CITY



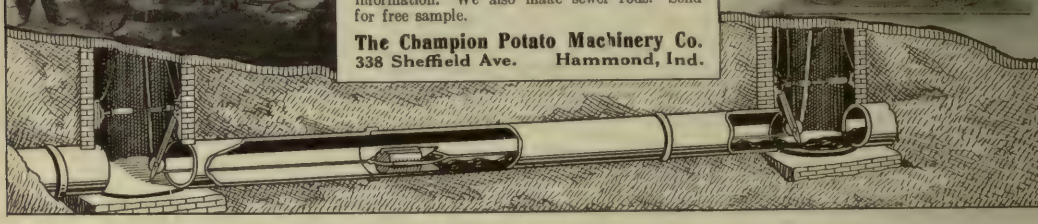
SEWER CLEANING MACHINERY

The Kuhlman Sewer Cleaning Apparatus will clear any sewer of dirt, gravel, sand, cinders, rags, paper, tar or practically anything.

It does the work quickly and cheaply. It's a great time and money saver. It is being utilized by scores of progressive municipalities all over the country.

Write at once for prices and other interesting information. We also make sewer rods. Send for free sample.

The Champion Potato Machinery Co.
338 Sheffield Ave. Hammond, Ind.



AMERICAN CAST IRON PIPE CO.

MANUFACTURERS OF

BIRMINGHAM, ALA.

SALES OFFICES
Birmingham, Ala., Box 908
Columbus, Ohio, 607 New Hayden Bldg.
Minneapolis, Minn., 712 Plymouth Bldg.
New York City, No. 1 Broadway
Chicago, Ill., 512 1st National Bank Bldg.
Dallas, Tex., 1217 Praetorian Bldg.
Kansas City, Mo., 716 Scarritt Bldg.
San Francisco, Cal., 711 Balboa Bldg.

LYNCHBURG FOUNDRY COMPANY

Bell and Spigot and Flanged

GENERAL SALES OFFICE: Peoples Gas Building, CHICAGO, ILL.

MATHIESON ALKALI WORKS, Inc.

Niagara Falls, N. Y.

Castner Electrolytic Process

Eagle-Thistle Brand

CHLORIDE OF LIME

In 200, 450 and 750-lb. drums
Strongest, quickest-settling, most reliable.

LIQUID CHLORINE

Pure anhydrous, for use with any control apparatus. In improved and convenient cylinders, 105 and 150 lbs. net.

ARNOLD, HOFFMAN & CO., Inc.

Sole Agents

Boston, Providence — 61 Broadway, New York — Philadelphia, Charlotte, N. C.

APPROVAL

HERSEY DETECTOR METER

The Hersey Detector Meter has been accepted for eleven years in 3", 4", 6", 8", 10" and 12" sizes without any restrictions or conditions of any kind by every Insurance Company, Stock and Mutual, doing business in the United States, and by the Water Departments and Water Companies in more than 500 Cities and Towns for use on over 3,000 Fire Services protecting nearly $2,000,000,000 worth of Insured Property

HERSEY MANUFACTURING COMPANY

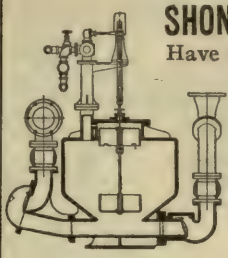
BOSTON, NEW YORK, CHICAGO — COLUMBUS, O., PHILADELPHIA, ATLANTA — SAN FRANCISCO, LOS ANGELES, PORTLAND, ORE.

TRADE MINWAX MARK

THE PERMANENT
WATERPROOFING

Used on notable municipal works the country over. Send for the "Minwax" Bulletins describing waterproofing and protective products for every purpose.

THE MINWAX COMPANY, Inc.
18 EAST 41st STREET NEW YORK



SHONE SEWAGE EJECTORS

Have been used for pumping city sewage in all parts of the world for over 35 years.

Unequalled for reliability, economy and durability.

Automatic and odorless.

Send for Bulletin P 4000

SHONE COMPANY
231 Institute Place, CHICAGO

Manufacturers of CAST IRON PIPE

for WATER—GAS—CULVERTS—SEWERS

Special Castings:-Also Flexible Joint Pipe-Cylinders-Tubes, Milled and Plain Ends-High Pressure Fire Service Pipe.

"Quality and Service Guaranteed"

WARREN FOUNDRY & MACHINE CO

Sales Offices: 11 Broadway, N.Y. 201 Devonshire St., Boston, Mass. Works: Phillipsburg, N. J.

MICHIGAN
PRODUCTS

Fire Hydrants
Gate Valves
Sluice Gates
Check Valves
Foot Valves
Shear Valves
Tide Valves
Sleeve Valves
Tapping Machines
Indicator Posts
Valve Boxes

FLOWER-STEPHENS MANUFACTURING COMPANY
103 Parkinson Street, Detroit, Mich.

NEW YORK CHICAGO
Keystone and Eureka
Water Meters
Pittsburgh Meter Co.
East Pittsburgh, Pa.
LOS ANGELES SEATTLE
COLUMBIA, S.C. KANSAS CITY

Five Hundred Million Dollars Wasted

The above amount was wasted last year in the United States, according to report of Bureau of Mines.

This means the need of a higher state of efficiency in our power generating methods, to provide more energy to end the war.

Our Specialized Power Engineering Experience is at your service. Bulletin No. 156 on request.

THE BRUCE-MACBETH ENGINE CO.
2137 Center St., N.W. Cleveland

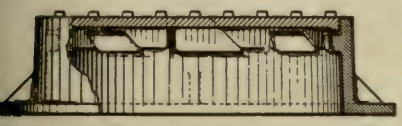
P&C CO

Water Gates & Fire Hydrants

BUILT FOR UTILITY AND DURABILITY

Write for Booklet

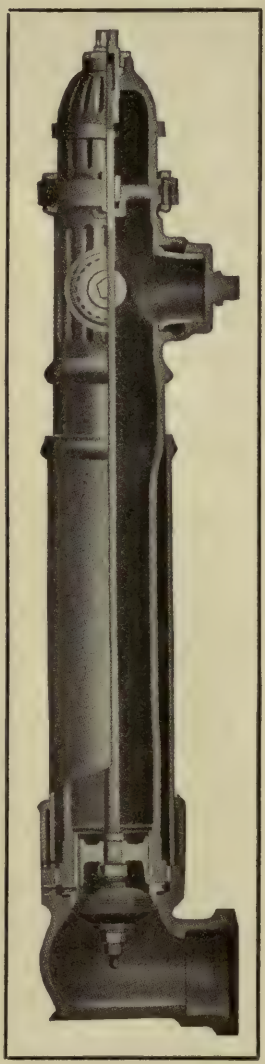
PRATT & CADY CO., INC. HARTFORD, CONN.



WM. E. DEE COMPANY
80 N. La Salle Street Chicago, Ill.

We manufacture Manhole, Catch Basin and Sewerage Castings of all Kinds. We make anything in Gray Iron. Write for our prices.

Mathews Fire Hydrants



A Recognized Standard

Made in Standard
and High Pressure Types

Frost-Proof—
Positively Automatically Drained—
Always Dependable

GATE VALVES
For All Purposes

CAST IRON PIPE
and
FITTINGS

"REDUCED" Fittings

R. D. WOOD & CO.

Philadelphia, Pa.

Write for Catalogues and Prices

WHAT ONE CITY THINKS
OF THE
SANITATION R-W PROCESS
OF SEWAGE TREATMENT

"One of America's Greatest Summer Resorts"

CITY OF WILDWOOD
CAPE MAY COUNTY
NEW JERSEY

FRANK E. SMITH, Mayor
REUBEN W. RYAN, Director of Finance
WILLIAM C. HENDEE, Director of Streets
JAMES E. WHITESELL, City Clerk
ROBERT J. KAY, City Treasurer

Wonderful Bathing Beach
Best Fishing on the Coast
Excellent Orchestra Music
Five Miles of Boardwalk

WILDWOOD, N. J. September 10, 1917.

The Sanitation Corporation,
Morris Building,
Philadelphia, Pa.

Gentlemen:-

Replying to your letter regarding the operation of our Sewage Treatment Plant, and the disposition of the screenings at the plant, I would advise that we have operated the plant during this past summer succesfully and most satisfactorily.

The maximun flow was cared for by two screens without any difficulty and the screenings are delivered containing about 80 to 90 percent of water and in a very fresh condition. These screenings we have found no difficulty in handling directly at the plant by composting, using street sweepings as a composting medium. Whenever we were short of sweepings, we used sand. In this way we have carried and have now, the entire quantity of screenings produced during the summer and will dispose of them this fall for agricultural use, a number of farmers expressing a desire to obtain same.

We have not suffered any inconvenience or annoyance whatever by this method of disposition of the screenings, nor have any complaints been lodged with us or against us by near-by neighbors.

If you desire further particulars, we shall be pleased to give you same.

Yours very truly,

W. C. Hendee
Director.

WCH/RH.

For full details of this Process write for copy Bulletin G. 4

THE SANITATION CORPORATION 50 CHURCH STREET NEW YORK

Trade **LEADITE** *Mark*

Registered U. S. Patent Office

For Jointing Cast Iron Water Mains

NO CAULKING required

Saves 50% to 65%

Write for information and price

THE LEADITE COMPANY, Inc.

100 S. Broad Street Philadelphia, Pa.

SECURITY SEWER RODS

Send for Flyer No. 20

They cannot buckle or uncouple in the duct

Security Rods are made from second growth hickory, with malleable iron couplings swedged or shrunk down very tightly on to the curved places at end of sticks. Security couplings cannot come off.

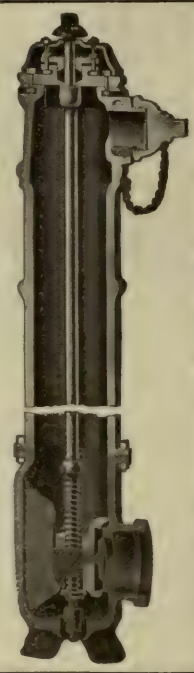
Joint and unjoint easily and quickly—light weight—long runs easily made. No slack but lend themselves to all practical bends.

Three-foot Rods, 65 cents each

Four-foot Rods, 75 cents each

F. BISSELL COMPANY, 226-228-230 Huron Street Toledo, Ohio

FIRE HYDRANTS



Frost-Proof

Simple-Efficient

All parts removable without digging up hydrant. Special device prevents street from being flooded should stand pipe be broken. Minimum expense to install and maintain.

LUDLOW

GATE VALVES

FOR

Water, Steam Gas, Oil, Hydraulic or Electric Operated

All styles, any size, all pressures

- - THE - -

Ludlow Valve Mfg. Co.

TROY, N. Y.

Branch Offices

New York Chicago Boston Philadelphia Pittsburg Kansas City

SLUICE GATES, CHECK VALVES, AIR VALVES, INDICATOR POSTS, ETC.

GATE VALVES **EDDY** FIRE HYDRANTS

Hydraulically and Electrically Operated Valves and Sluice Gates. Valves Designed For All Kinds of Service.

EDDY VALVE COMPANY, WATERFORD, N. Y.

New York Chicago Boston San Francisco Philadelphia

COLUMBIAN IRON WORKS

CHATTANOOGA, TENN.

Manufacturers of Fire Hydrants, Valves, Valve Boxes, Sluice Gates, Meter Boxes and Water Works Supplies

ESTIMATES PROMPTLY FURNISHED

3c per M square feet

for labor to apply Atlas Chemical Weed-Killer. Permanently eliminates weeds for the entire season.

Diluted with 20 parts water and apply in sprinkling wagon or watering can.

Full particulars and prices furnished on request.

Chipman Chemical Engineering Co.
Incorporated

95 Liberty St. New York

ATLAS WEED-KILLER

Grass and Weed-Killing Chemical

DIXON'S SILICA-GRAPHITE PAINT

Pigment-Flake Silica-Graphite

Nature's own product, mined from the same bed. The silica is hard, the graphite is soft, each helps the other, both practically indestructible—an idea pigment for protective purposes.

Vehicle-Boiled Linseed Oil

No paint vehicle has yet been found to equal linseed oil—the only improvement is to boil it.

Our Part

We blend the silica-graphite and best quality boiled linseed oil by long, careful and scientific grinding, into a harmonious, protective paint that for over 50 years has been making long-time records for endurance and low cost.

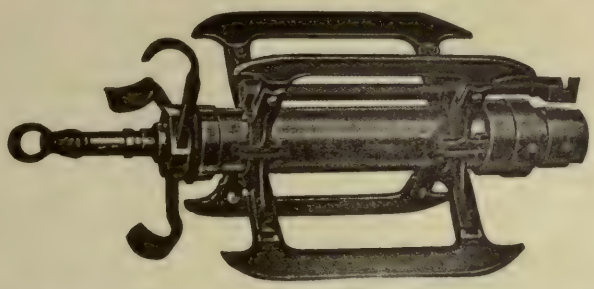
Write for Booklet No. 107-B.

Made in JERSEY CITY, N. J. by the

JOSEPH DIXON CRUCIBLE CO.

Established 1827

THE TURBINE



CLEANS ANY SIZE SEWER

The Turbine Sewer Machine will clean all sizes of sewers from six to thirty inches in diameter. It frees your sewer from the dirt, rags, cinders and other refuse, at a small cost. Let us give you a demonstration of what this machine can do. Saves Labor and Money.

Write for full particulars.

TURBINE ROD COUPLINGS

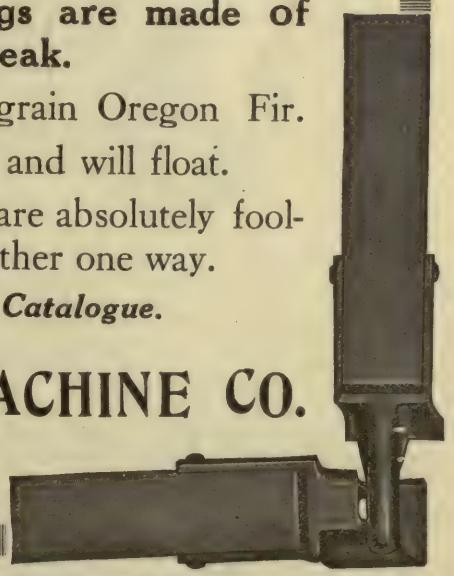
All Turbine Rod Couplings are made of Malleable Iron and will not break.

All Wood stock is straight grain Oregon Fir.

These Rods are Water-Proof and will float.

The Turbine Rod Couplings are absolutely fool-proof as they can only be put together one way.

Send for Free Sample and Catalogue.



TURBINE SEWER MACHINE CO.

197 Eleventh St. Milwaukee, Wis.

DEMING POWER PUMPS
For Municipal Service

The illustration represents the municipal pump house at Dickinson, N. D. A Deming Power Pump in this house, forces the water to an elevated tank, where it is constantly available for domestic needs and fire protection.

In hundreds of municipalities throughout the country, may be found pump houses like this with a Deming Power Pump or Deep Well Head inside. If your town is interested in pumping equipment, send for our 192-page Power Pump Catalogue "J." Municipal officials may have it on request.

THE DEMING COMPANY, Salem, Ohio

HAND AND POWER PUMPS FOR ALL USES

GENERAL DISTRIBUTING HOUSES:

Chicago: Henion & Hubbell.
Pittsburgh: Harris Pump & Supply Co.
New York: Ralph B. Carter Co.
Buffalo: Root, Neal & Co.
Boston: Chas. J. Jager Co.
Richmond: Sydnor Pump & Well Co.
Philadelphia: W. P. Dallett.
Denver: Hendrie & Bolthoff Mfg & Sup. Co.
San Francisco: Simonds Machinery Co.
Charlotte, N. C.: Realty Building.
Houston, Tex.: H. A. Paine.
Agencies in all principal cities.

"Let those now love who've never loved before,
And those who always loved now love the more."

LAMBERT WATER METERS

Long Life.

Lasting Accuracy.

All parts interchangeable.

Maintenance cost nominal.

Their merits have made meter systems popular. A good article is always worth the price. All improvements which the tests of time and long service show to be requisite in a **Perfect Water Meter** are embodied in the **Lambert.**

ONE MODEL ONLY

Made in all sizes, ⅝" to 6", of best bronze Composition throughout, fitted with Unbreakable reinforced disc-pistons.

Illustrated Price List on Application. Address Dept. C.

THOMSON METER CO.
100-110 BRIDGE ST., BROOKLYN, N.Y.

Sluice, Head and Penstock Gates
Flap and Shear Valves

The kind that don't wear out

COLDWELL, WILCOX COMPANY
Water Street Newburgh, N. Y.

13 New Atlantic Outfits on one job
14 on another—read why

Two great Government jobs recently required quick work. The Aberthaw Construction Co. found the right pumping outfit in putting to work at the $9,000,000 plant at Squantum, Mass., 13 new Atlantics and at Embarkation Camp Merritt, Cresskill, N. J. the contractor used 14 Atlantic outfits and they did the trick.

ATLANTIC PUMPING ENGINES

for pumping out Trenches, Excavations, Pier Foundations, Filling Water Carts and Tanks, Road Work—Testing Water Mains

Telegraph or write for net prices and illustrated catalog

HAROLD L. BOND COMPANY, 383 W. Atlantic Avenue BOSTON, MASS.

Contractors' Tools, Equipment and Supplies

AGENTS IN PRINCIPAL CITIES

Filtration Plants

for

Municipal Needs

Y. M. C. A's, Colleges and all institutions

Write for Booklet

NORWOOD ENGINEERING CO.

Florence Mass.

GREAT WESTERN ELECTRO CHEM CO.
BUSH, BEACH & GENT
SOLE AGENTS
CARBON TETRACHLORIDE
POTASSIUM CHLORATE
BLEACHING POWDER
LIQUID CHLORINE
CAUSTIC SODA
SAN FRANCISCO, CAL.

A Contract is a Contract

80 Maiden Lane
NEW YORK

Holbrook Building
SAN FRANCISCO

LIQUID CHLORINE

CHLORIDE OF LIME
(Bleaching Powder)

—SODA ASH—

GRAVITY FILTERS PRESSURE
WATER SOFTENING PLANTS AND HYPOCHLORITE APPARATUS
ALL VARIETIES OF CHEMICAL FEEDING DEVICES
Write for Bulletin 17-3
THE NEW YORK CONTINENTAL JEWELL FILTRATION CO.
15 Broad Street, New York

"RENSSELAER" VALVES
All Sizes All Pressures All Purposes

"COREY" FIRE HYDRANTS
Valve Boxes Indicator Posts Air Valves

RENSSELAER VALVE CO.
General Offices, TROY, N. Y.
NEW YORK, Hudson Term. Bldg. CHICAGO, Monadnock Block PITTSBURGH, Oliver Bldg. SEATTLE, Arctic Bldg.

The Best Material for CALKING Joints in Cast Iron Pipes is

Ulco Lead Wool

Write for particulars to

UNITED LEAD COMPANY
111 BROADWAY, N.Y. CITY

Meter, Roadway, Service and Valve Boxes

Municipal and Special Castings

ANYTHING for WATERWORKS

Write for Catalogue and Prices

MODERN IRON WORKS
510 Ohio Street Quincy, Illinois

A POINTER *for* WATER WORKS MEN

HOW TO CUT COST OF OPERATION

Coal and chemicals are high and scarce, and water departments are obliged to find some way of getting along with the least possible amount of fuel.

There is *one* good way to do this, and that is to reduce water-waste to a minimum.

The Cole Recorder Will Help

It cuts out all avoidable and unnecessary waste and leaks. It keeps tab on your water supply and gives an absolutely correct chart-record of the amount of water pumped daily. By comparing this amount with the amount consumed you can readily see whether there is a wastage and just how much. The Cole Recorder also shows whether your pumping machinery is keeping up-to-the-mark.

Bear in mind that by reducing this waste, it is possible to dispense with a considerable amount of pumping, which means less steam, fuel and labor. Don't you think this saving is worth while?

The Cole Recorder is portable, accurate, sensitive and durable, and should be used in every station and on every gravity supply main.

Write for further information now.

THE PITOMETER CO.
55 DUANE ST., NEW YORK CITY

Water Works departments can help materially in forwarding Uncle Sam's conservation program, and at the same time cut a big slice off their own operating expenses.

Did you ever stop to consider that clogged mains necessitate the use of an extraordinary amount of coal, thereby creating a large extra expense?

Your mains can be cleaned easily, quickly and cheaply by

The National Method

This method "cleans and scours" the mains, and promptly restores them to normal capacity. Scores of cities have had their mains cleaned in order that they may get a stronger pressure and affect a saving running into thousands of dollars annually.

Write for free booklet "The Cleaning of the Water Main"
It shows you how to cut down your coal bill.

National Water Main Cleaning Co.
Hudson Terminal Building
NEW YORK CITY

Chemicals for Water Purification

We manufacture highest grade of

Sulphate of Alumina

also

Chloride of Lime

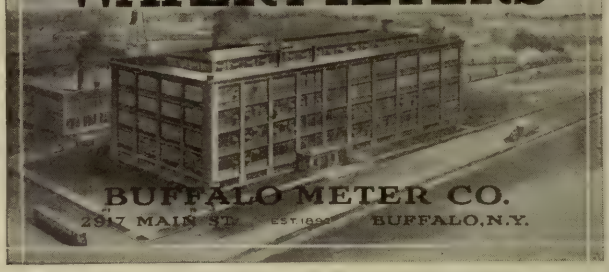
Liquid Chlorine

PENNSYLVANIA SALT MFG. CO.

115 CHESTNUT STREET :: PHILADELPHIA, PA.

AMERICAN AND NIAGARA

WATER METERS



WRITE FOR LITERATURE BELOW

WRITE FOR TRIAL METER

WATER METER RATES AND REGULATIONS
ADVANTAGES OF USING WATER METERS
MODEL WATER METER SPECIFICATIONS
FACTS AND FIGURES ABOUT OUR METERS IN SERVICE
AMERICAN AND NIAGARA WATER METERS
WATER METER ACCESSORIES
SETTING AND TESTING WATER METERS
PRICE LIST WATER METERS AND ACCESSORIES

ADJUSTABLE MANHOLE TOP

An Adjustable Manhole Top with a cover which stays in place and does not Rattle.

Especially adapted to meet the strenuous requirements of varying grade changes and surface wear—incident to heavy and mixed traffic.

Notwithstanding general shortage of materials and difficulties of transportation. We can make PROMPT SHIPMENTS.

Write us for detailed information.

S. E. T. VALVE & HYDRANT COMPANY
Hudson Terminal Bldg., New York City

PIVOT LOCK COVER

SAFE, ECONOMICAL and SANITARY
Write for details
THE EAST IRON AND MACHINE CO., Lima, O.

ORIGINAL

OF COURSE WE HAVE IMITATORS
YOU KNOW WHY—

the Clark Meter Box has *made good* in 25 years of actual service. Thousands of water departments use it. No other "*Just As Good*" Can't Be.

Prices are the lowest. Quick delivery. Other Clark Goods are in same class.

THE CLARK METER BOX
Trade Mark

H. W. CLARK CO.
130 So. 17th St., Mattoon, Ill.
Everything for the Water Works
New York — Salt Lake City
San Francisco — Chicago

We've got too much

to advertise here, so we've issued

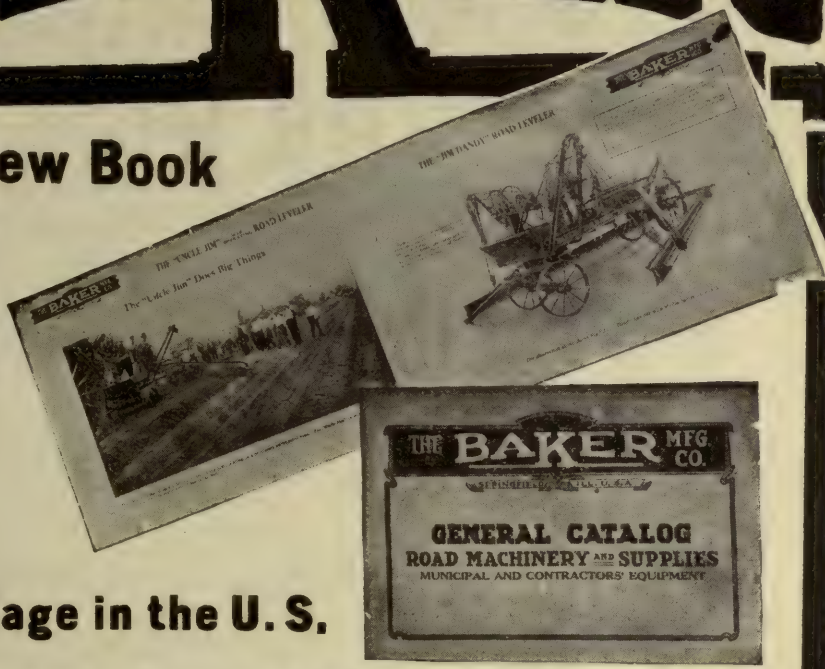
Bulletin 227

44 pages. Send for it! FREE!

ZELNICKER IN ST. LOUIS

Rails, Equipment, Machinery, Piling, Tanks

BAKER



Our New Book Should Be On File In Every City Town And Village in the U. S.

It shows photographs of actual road building in many important phases: excavating, leveling, grading, filling, spreading, scarifying—and how to do this work in the most-up-to-the-minute

fashion at the least cost to city and county. It even takes up that difficult matter of handling snow in the winter.

More than a catalog, a directory of ways, means and tools for all municipal uses—a book that comes into play throughout the entire year. Here are some of the money saving road tools described:

The Baker-Maney Scraper, the self-loading dump wagon, that *digs.* For economy in dirt moving on 150 to 2,000 ft. hauls nothing has ever yet touched it—not even the giant steam shovel or the elevating grader.

Uncle Jim Road Leveler—a leveler that *makes* road complete as it goes.

Baker Graders—those famous" Dreadnought" and "20th Century" road builders which have been standard equipment throughout the U. S. for years.

Baker Drag—friend of man and friend of horse, built in a way that gets results without great weight, yet it is the very acme of strength.

Baker Snow Plows, sweepers, scarifiers, slips, dump wagons, plows, etc. You ought to have this catalog. It will brush you up on the new things coming out and may save you much time in investigating. It's free.

THE BAKER MFG. COMPANY
503 Stanford Ave., Springfield, Illinois

New York	Baker-Barron, Inc., 221 W. Broadway
Denver	H. W. Moore & Co., 18th & Wazee Streets
Los Angeles	D. G. Bevis & Co., 223 Marsh Strong Bldg.

MAIL THIS COUPON

Baker Mfg. Co., Springfield, Ill.

Without obligation, send us your catalog described above.

.....
City and State

.....
Official to whom it is to be sent

BRICK! BRICK! BRICK!

We are in the heart of the first quality shale lands and we are planning to make brick for every conceivable purpose.

If you are interested in paving brick, conduits or building brick, get in touch with us.

We invite correspondence from municipal officials or anybody else seeking information about brick.

THE SCHUYLKILL VALLEY VITRIFIED PRODUCTS CO.
Oaks, Montgomery County, Pa.

CONCRETE FOR PERMANENCE

A Greenwich, Conn., road built of Atlas Portland Cement concrete.

Good roads and good business

A highway should be a sound investment. It ought to outlive the bonds that pay for it, and annual charges for upkeep ought to be small compared with interest on the bonds. Otherwise the bonds don't come anywhere near covering costs.

The Portland Cement concerte highways meets the exacting tests of the cost expert. It costs very little more to build than the non-permanent type and nowhere near as much for maintenance—and it's likely to be in good shape, carrying heavier traffic than ever, a half dozen years after the 15-year highway bonds issued for it are paid off and a dozen years after a macadam road (built the same year as the concrete road) has had to be rebuilt!

There are many other advantages in the concrete highway. Ask for our free book on "Concrete Highway Construction."

Our Highway Department on request prepares plans, proposals and cost estimates and arranges for necessary inspection.

The Atlas Portland Cement Company

Member of the Portland Cement Association

New York Chicago Philadelphia Boston St. Louis Minneapolis Des Moines Dayton Savannah

PORTLAND ATLAS CEMENT

"The Standard by which all other makes are measured"

HOW THEY DO IT IN OTHER PLACES

Valuable Illustrated Material, Statistics, etc., Regarding Methods, Materials and Appliances for Public Improvement Work, Sent Free of Charge

Manufacturers, engineers and others doing business with municipalities are invited to submit catalogs or circulars suitable for mention in these columns. THE AMERICAN CITY *should always be mentioned when writing for this material. Officials who check over these items each month and write for such printed matter as interests them will find this a convenient way of keeping their information files up to date.*

Expansion Joints for Streets and Sidewalks.

Free samples of the Elastite Expansion Joint suitable for brick, granite, wood-block or concrete pavements and sidewalks, are distributed to those interested by the Philip Carey Company, 8 Wayne Avenue, Lockland, Cincinnati, Ohio, together with detailed literature showing the latest and best practice in connection with preventing cracking and bulging of payments.

A New Process Tire for Hard Service.

The story told in "Republic Tires," a pamphlet devoted to the description of the new "Prodium Process" tires manufactured by the Republic Rubber Company, Youngstown, Ohio, is one that should make a strong appeal to users of pneumatic tires. It places before the reader a non-skid tire for which remarkable wearing qualities are claimed, and which is therefore particularly adapted to heavy motor apparatus for reliable emergency use. Space is also given in the rear of the booklet to information about the Republic Black-Line red inner tube, which has made an unusual record in the motor world.

Water Economy Thru Pitometers.

Bulletin No. 3 of the Pitometer Company, 55 Duane Street, New York City, contains a picture-story of this company's products. The illustrations cover the portable test pitometer, standard rod meter without manual recorder, slip indicators, prism photo recorder, and method of street connection. Brief captions characterize the outstanding features of each instrument and the purposes for which it is designed. This booklet is an interesting guide which should be in the hands of water-works officials.

Handy Wiring Tables and Illumination Data.

Under this title the George Cutter Company, 413 Notre Dame Street, South Bend, Ind., has issued a pocket-size booklet containing information on planning lighting systems, of value to building superintendents, public works officials, contractors and others responsible for such installations. It is replete with price lists, tables and illustrations of numerous Cutter accessories for lighting and wiring.

A Paint That Sticks.

L. Sonneborn Sons, Inc., 264 Pearl Street, New York City, manufacturers of paints and wall coatings, have issued two interesting folders descriptive of their products. One of these, entitled "The Modern Sanitary Wall Coating," tells the story of "Cemcoat, the golden mean between paint and enamel." This product, applied with a brush, has wearing qualities that claim for it special consideration by building superintendents and contractors, who desire an exterior or interior wall coating that will give lasting satisfaction and at the same time preserve its attractive appearance. The other folder describes in brief some of the "Amalie" brand paints manufactured by this company.

Reflectors and Refractors for Type C Lamps.

A pamphlet has been issued by the Holophane Glass Company, 340 Madison Avenue, New York City, on the subject of "Holophane Developments for Type C Lamps," which is of value to building superintendents and others interested in efficient scientific lighting. The pamphlet is written in a free, understandable style without technicalities, and is furnished with numerous illustrations to make the text clear. It describes reflector and refractor units and fixtures for office, schoolroom and window lighting. Charts, diagrams and tables are included, together with a compreehnsive price list.

Let Shrubs and Ivy Beautify Your Buildings and Grounds.

"The Practical Benefits Derived from Beautifying Public and Industrial Buildings with Trees, Shrubs and Vines" forms the subject of a pamphlet of unusual interest issued by Bobbink & Atkins, Nurserymen, Rutherford, N. J. The views shown in this booklet should in themselves convey some practical ideas to public officials who take an interest in making their city more beautiful and inviting. Another pamphlet on the subject of "Heart Cypress Tubs, Rustic Work, English Garden Furniture" contains some excellent suggestions for the beautification of public and private grounds and buildings by the judicious use of these garden furnishings.

A Calendar for 1918.

A calendar for 1918 that would grace any engineer's or contractor's office has been prepared for free distribution by the Atlas Portland Cement Company, 30 Broad Street, New York City. The architectural and structural possibilities of concrete are brought out in an interesting manner by means of large photographic illustrations on the upper half of each sheet of the calendar.

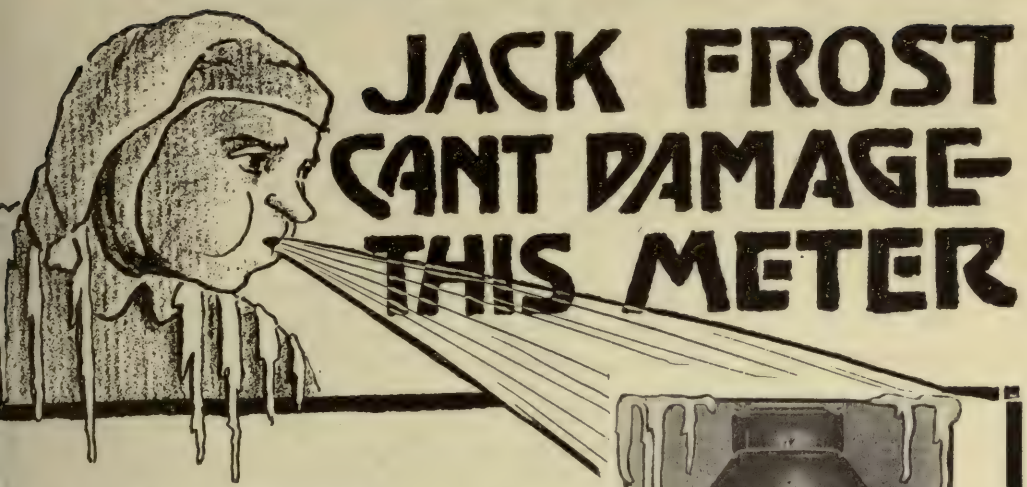
A New Zelnicker Bulletin.

"Zelnicker in St. Louis" has issued, under date of November 24, 1-917, Bulletin No. 227, listing the latest offerings of that company in rails, cars, locomotives, cranes, tanks, heavy machinery, compressors, boilers, hoists, lamps and other public utility accessories.

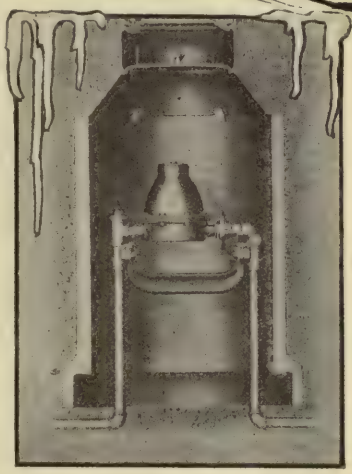
Poured Joints for Vitrified Clay Pipe.

A folder of unusual interest has been issued, under the above title, by the Sewer Pipe Manufacturers' Association, Second National Building, Akron, Ohio. It describes a flexible mold of overlapping sheet metal plates strung on small steel cables, which is used in pouring cement grout for joints in vitrified clay pipe lines. Certain definite advantages of this method of jointing clay pipe are enumerated, and the whole process is discussed in detail.

Continued on page 88



WINTER is here once more. Run back in your mind over the years gone by and think of the number of water meters that were damaged by frost or blows and think of what it cost to repair them! All this extra expense could have been saved if you had only given your meters proper protection. Are you going to let this happen again this year? You can give your meters *absolute protection* by placing them in Ford Meter Boxes. The Meters will then be free from the destroying hands of Jack Frost and human meddlers.



Here are eight good reasons why you should use the Ford Meter Box.

1. Meter is safe from frost damage.
2. Meter is safe from tampering.
3. Consumer is always at home to reader and in consequence inspector will read many more meters per day than with basement settings.
4. The reader is relieved of any temptation to record fictitious readings because of consumers absence from home.
5. The liability of admitting a burglar under guise of a meter reader is avoided.
6. All water entering property is registered and leaks on inside piping will be promptly repaired.
7. Meter is less liable to damage from hot water backing up from range boiler when located at curb.
8. Ordinary curb box and curb stop may be done away with if desired.

Write us for illustrated material at once and learn how you may save real money for your city

The Ford Meter Box Co., Wabash, Indiana

Valuable illustrated material, catalogs, statistics, etc., as mentioned below, relative to methods, materials and appliances for public improvement work, will be sent free of charge if you mention THE AMERICAN CITY. See page 34a.

Automatic Pumps and Receivers.

Bulletin D-1301, issued by the Worthington Pump and Machinery Corporation, 115 Broadway, New York City, prefaces a discussion of various types of piston pressure pumps with a short paragraph on the chief causes of inefficiency in pumps, followed by a suggestion of the remedies which the Worthington pumps are designed to insure. A page is devoted to describing each pump illustrated. On the back page of the pamphlet is a list of the numerous products manufactured by the Deane Works of this corporation, situated at Holyoke, Mass.

A "One-Man" Trench Tamper that Saves Labor.

Weak trenches mean bad pavements and inefficient service. The Pawling & Harnischfeger Company, of Milwaukee, Wis., suggests a practical remedy and preventive in its "P & H" power traction trench tamper, described in the company's bulletin No. 8 C. This pamphlet should be in the hands of public works officials who are looking for an effective solution of their trench-filling problems. Efficiency, speed and economy are the three cardinal attributes claimed for this machine. The booklet also describes power excavators and back fillers.

Industrial Motors.

The second of a series of catalogs of industrial motors has just been distributed by the Westinghouse Electric and Manufacturing Company, of East Pittsburgh, Pa. This is known as Catalogue 30, and covers the company's complete line of direct-current motors and generators for industrial service.

"No Parking" Signs that Command Attention and Respect.

Human beings are thoughtless creatures at best. When they ride in automobiles they must be warned, "Please Do Not Park Here." To this end, the Indestructible Sign Company, Columbus, Ohio, has issued a booklet on the subject of "No Parking" Signs. A number of different warning devices are described and illustrated, and other pertinent information of interest is included.

Asphaltic Concrete Paving.

Two pamphlets containing information of interest to contractors and public works officials have been issued by The Amies Road Company, Drake Building, Easton, Pa., manufacturers of Amiesite, an "asphaltic concrete paving material, laid cold." One of these booklets contains a complete record of installations dating from 1909 thru 1916. The other embodies the opinions of highway officials, engineers, street commissioners and others, given in letters received in reply to a circular letter sent out by the Amies Road Company on May 15, 1916, requesting unbiased judgment on the merits of Amiesite pavements.

Du Pont Products.

Another Du Pont Products book has just been issued by E. I. du Pont de Nemours & Co. and its associates, Du Pont Fabrikoid Company, Du Pont Chemical Works, The Arlington Works, and Harrisons, Inc. On account of the enormous expansion of their business, made necessary by the war and by the inability of this country to longer import many of its chemicals and raw materials, it became necessary for the Du Pont Company to greatly expand its industrial activities, and the purpose of the Du Pont Products book is to tell the public of the hundreds of commodities they make and sell, many of which until recently had never been made on this continent.

Valves and Hydrants.

Municipal officials concerned in securing efficient water systems will appreciate the catalog-booklet which has been issued by the Flower-Stephens Manufacturing Company, 103 Parkinson Street, Detroit, Mich., manufacturers of the widely known "Michigan" products. In this booklet are described and illustrated a number of fire hydrants and valves constructed to meet the demands of hard and constant service with a maximum of wear and efficiency.

A Wagon for Every Need.

Two interesting publications have recently been issued by the Studebaker Corporation, South Bend, Ind., makers of "everything on wheels." One of these is the Studebaker Almanac for 1918, containing much information of value to dwellers in rural communities. The other is the company's catalog No. 1105, which presents with unusual force the details of construction of the Studebaker dump wagon. In the rear of the catalog are illustrated descriptions of gravel-spreading wagons, bottom-dump box wagons, road oilers and sweepers, street flushers and sprinklers, contractors' carts, sprayers, garbage wagons and harness.

A Concrete Mixer for "Any Old Job."

"Mixers, like men, are judged by their work." So begins the foreword of an attractive and convincing pamphlet issued by the Jaeger Machine Company, 215 West Rich Street, Columbus, Ohio, under the title "Concrete Mixers." With this point ever in the foreground, the pamphlet aims to convey a comprehensive idea of the performance of Jaeger mixers, paving, spouting and grouting outfits, and accessories. The booklet is well planned, roomy and lavishly illustrated—three good reasons why it will be read clear thru without stopping. It should be a safe and handy purchasing guide for contractors and public works officials everywhere.

An Iron Fence Frame Adds Beauty and Dignity to Your Property.

Property owners and park officials who question the effectiveness of iron fences for beautifying and dignifying private or public property may well be referred to the "Book of Designs 'A,'" issued by the Stewart Iron Works Company, 527 Stewart Block, Cincinnati, Ohio. In this catalog are shown nearly 150 photographs of property surrounded by ornamental iron fences made by the Stewart Company. Other illustrations show ornamental metal lamp standards, fountains, statues and garden furniture.

Pneumatic Sewer Ejectors for Public Buildings.

Bulletin No. P-4000, issued by the Shone Company, 231 Institute Place, Chicago, Ill., directs the attention of building superintendents to their single and duplex pneumatic sewage ejectors. Illustrations and plans show the working mechanism and the method of installation of these ejectors. Dimension tables, explanatory notes, and installation specifications are other features which especially commend this pamphlet to those interested in efficient building sanitation.

Gravity and Pressure Filters for Water-Works and Swimming Pools.

An attractive pamphlet bound in green paper has been issued by the New York Continental Jewell Filtration Company, 15 Broad Street, New York. It presents in a graphic and interesting way the claims of the pressure and gravity filters manufactured by this company. The installations at Decatur and Quincy, Ill., are described in detail, and a partial list of swimming pool and Y. M. C. A. installations is furnished. A number of testimonial letters serve to substantiate the arguments advanced in favor of these filters.

CHAPMAN VALVES
and
ACCESSORIES

Everything for Water Works and Sewage Disposal but the Pipe.

Corporation and Curb Cocks.

Goosenecks—made up with Anderson couplings which eliminate wiped joints.

Gate Valves
Sluice Gates
Hydrants

Catalogue containing valuable information free on request.

Write Today

THE CHAPMAN VALVE MFG. CO.
Indian Orchard, Mass.

SCOFIELD ENGINEERING COMPANY

PHILADELPHIA

Consulting Engineers

An organization of thoroughly trained experts with a wide successful experience

We offer a professional engineering service of unusual value

Municipal Improvements

Sewerage, Water Works, Electric Systems, High Pressure Pumping Stations, Streets, Bridges

Public Service Properties

Railway, Electric, Gas, Water, Hydraulic

Industrial and Textile Plants

Refrigeration

Ice and Cold Storage Plants

Keep Up Public Improvement

Keep up your streets, have them paved with a substantial construction that will stand the motor vehicle traffic.

PAVE YOUR STREETS WITH BITULITHIC

It is necessary for cities to have good pavements on their streets.

BEFORE PAVING
Pleasant Street, New Bedford, Mass., showing Old Macadam before paving with Bitulithic

AFTER PAVING
Pleasant Street, New Bedford, Mass., after paving. Bitulithic surface laid over old Macadam

Conserve the City's Assets by resurfacing old Macadam or old avements with BITULITHIC.

Start your plans now—be ready for prompt action when spring comes.

Street Pavement is one of the city's most important factors. A city is lways judged by the appearance of it's streets.

Over 400 cities throughout the United States and Canada have adopted ITULITHIC as a standard pavement for their city to the extent of over 1,000,000 square yards which is equivalent to over 2800 miles of roadway 30 et wide between curbs.

INSIST ON BITULITHIC
"The Best By Every Test"

It is to your advantage to investigate **BITULITHIC** before placing your ontracts.

Write today for Illustrated Booklets.

WARREN BROTHERS COMPANY
Executive Offices: BOSTON, MASS.

DISTRICT OFFICES:

New York, N. Y.
Portland, Ore.
Chicago, Ill.
Nashville, Tenn.
St. Louis, Mo.
Richmond, Va.
Phoenix, Ariz.
San Francisco, Cal.
Winnipeg, Man.
Toronto, Ont.
Montreal, P. Q.
Utica, N. Y.
Los Angeles, Cal.
Vancouver, B. C.

Put Public Buying on an Efficiency Basis

NOW, more than ever before, it is important that those having contracts to let, whether for new work or the furnishing of machinery or supplies, should consider the best methods of securing extensive competition and low bids.

Engineering News-Record

with a circulation of nearly 40,000 a week, reaches almost every worth-while contractor, manufacturer and dealer interested in public contracts.

Over 4,000 Official Proposals

have been published each year in Engineering News and Engineering Record, now consolidated as the Engineering News-Record. These small investments for advertising have invariably saved large sums on the contract prices. You can now cover the entire field and secure the greatest possible competition from reliable contractors by publishing your advertisements for bids in the

One Dominant Paper

This will put your public buying on an efficiency basis. It will make the tax payers' money go farther and will give you a reputation for a business administration. Local bidders always figure closer when they find that the letting of a contract is being advertised in Engineering News-Record — the

One Nationally Recognized Medium for Proposal Advertising

Ask for a free sample copy and see how other communities keep down their expenses

Engineering News-Record

10th Ave. at 36th St., New York

The Semi-Annual Index of THE AMERICAN CITY (July-December, 1917) is now ready and will be sent to Subscribers on application

HAROLD S. BUTTENHEIM, Editor THEODORE R. KENDALL, Engineering Editor M. V. FULLER, Associate Editor

THE AMERICAN CITY

Published Monthly by The Civic Press, Tribune Building, New York

EDGAR J. BUTTENHEIM, President HERBERT K. SAXE, Secretary-Treasurer JAMES H. VAN BUREN, Advertising Manager

Branch Offices: Chicago, 327 South LaSalle St., J. T. Dix, Western Representative; San Francisco, 320 Market St., W. A. Douglass, Pacific Coast Representative

Entered at the Post Office at New York, N. Y., as second-class matter

Vol. XVIII CONTENTS FOR JANUARY, 1918 No. 1

ARTICLES APPEARING IN THE CITY EDITION ONLY

The Treatment of Sewage by the Activated Sludge Process—Part I. 1

American Cities Appreciate the Need for More Toluol. 4

Methods and Materials for Paving Between Street Railroad Tracks. Seventh Article —The Practice in Toronto, Canada. 6

An Argument on War-Time Continuation of Preliminary Work on Public Improvements. 11

The Value of a Building Zone Plan. 13

American War Posters. 13

Poughkeepsie's Loyal Service League. 14

From Hand Tub to Motor Fire Truck 15

Paint the Fire Escape and Keep It Clear. . 17

The City and the Coal Bins. 18

Civic Work of Educational Institutions. . . . 20
- Elastic Schoolhouses
- The School Community

Conciliation and Arbitration in the Municipal Court of the City of New York. . . . 23

ARTICLES APPEARING IN THE TOWN AND COUNTY EDITION ONLY

One Year's Experience with the Federal Aid Road Law. 1

Gravel Road Protection and Maintenance. 5

Building Concrete Roads on Grade. 11

The Patrol System for Road Maintenance in North Carolina. 13

Road Development a Patriotic Duty. 14

Motor Truck Transportation. 15

Army Motor Truck Trains and Good Roads 18

Sanitary Privy Systems for Unsewered Communities. 19

One Way to Combat Rural Typhoid. 24

ARTICLES APPEARING IN BOTH EDITIONS

Buenos Aires: The Metropolis of the Southern Hemisphere. 25

Save Coal by Reducing Water Consumption 30

Items of Municipal Law. 32
- Duration of Water-Works Franchise
- Liability Concerning Sidewalks
- Licensing of Meat Dealers
- Changing Street Grades
- Discriminating License Ordinances
- Suits by Taxpayers

Forward Steps Reported by Municipal Officials and Heads of Departments. 33
- Agreement with Merchants Aids Collection of Waste Paper
- Better and Safer Fire-Fighting with New Nozzle
- A Year of Development in Park Maintenance
- A Practical Demonstration in Refilling Fire Extinguishers
- From Dimness to Brightness
- School Children—Public Health Delegates
- Speed in Police Work
- Liberty Bonds for Sinking Funds
- The Mosquito Control Work of a County
- War Time Development in Toronto Parks
- Municipal Bath-House in Business District
- Skating the Best Winter Sport
- A Step to Improve Municipal Reports

The Municipal Lighting System of Eugene, Oregon. 49

Dual Status of Municipalities. 53

Motorized Municipal Essentials. 54

News and Ideas for Commercial and Civic Organizations. 56
- Fertilizer Sold by Hannibal Chamber
- Annual Dinner Abandoned for Sake of War Charity
- A Remedy for Farm Labor Shortage
- Community Building Purchased by Board of Trade
- A Hotel Built by the Citizens
- A Full-Time City and County Health Officer
- A Car Efficiency Poster
- Rail Freight Data Secured
- Bungalow Group Housing at Lebanon
- Board of Directors Pursues Delinquent Members in a Body
- A Means of Preserving Man-Power
- New Bulletins
- Recently Issued Printed Matter

The Importance of Well-Shaded City Streets 69

Exposition Grounds Replanned as a Restricted Residence Park. 77

Methods of Cleaning Catch-Basins. 81

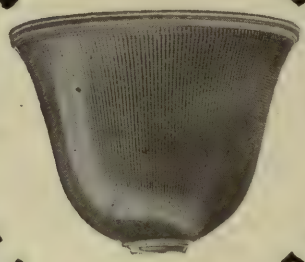
Conventions and Exhibitions. 85
- On the Calendar
- American Road Builders' Association

Pamphlets of Municipal and Civic Interest 87

Methods, Materials and Apliances. 89

Two editions of THE AMERICAN CITY are published each month, both containing the same number of pages. The distinction in contents is indicated above. The subscription price of either edition is $3.00. For $1.00 additional per annum, any subscriber may receive both editions; or any subscriber may have his name transferred from the mailing list of the City Edition to that of the Town and County Edition, or vice versa, without extra charge. Canadian subscribers pay 50c extra per year to cover postage; other foreign countries $1 per year extra.

Back numbers of THE AMERICAN CITY are kept in stock by the publishers.



The Sun and Holophane Alike
In Some Respects

JUST as the sun distributes its rays evenly over the earth, so the Holophane system of illumination diffuses the light evenly over the street, covering a wide area.

The Holophane Street Lighting Refractor, by a scientific arrangement of prisms, utilizes every ray from the source and floods the streets with a strong, full, non-glaring illumination.

You will not get the best results from your lighting system unless you utilize the Holophane unit. It makes a good lighting system *better*, regardless of style, type, make or design.

It can be used with any type of standard, either gas or electric.

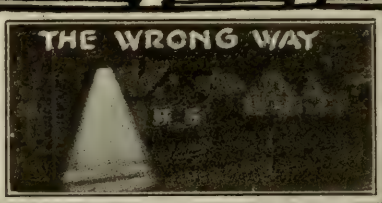
Ideal for city and suburban streets, parks and play-grounds.

Holophane cuts the cost of operation, and effects a saving which should not be considered lightly, in view of the present coal crisis.

If you want to prevent the waste of light on your streets, you ought to have our free literature. Why not send your address today?

HOLOPHANE GLASS CO., INC.

340 Madison Avenue Dept. A-22 New York City



UNIVERSITY LIBRARY

VOLUME XVIII
NUMBER 1

The American City

NEW YORK
JANUARY,
1918

The Treatment of Sewage by the Activated Sludge Process—Part I

Valuable Data from Milwaukee on this New and Effective Method of Sewage Treatment

EDITORIAL NOTE.—*The following article on the newest accepted process of sewage treatment, which will be published in three parts, is practically a complete publication of the paper of T. Chalkley Hatton, Chief Engineer, Milwaukee Sewerage Commission, read before the War Convention of the American Public Health Association at Washington, D. C. Mr. Hatton is one of the most authoritative writers on this subject in the United States, and this paper is his latest and most complete discussion of the subject.*

SINCE April, 1913, when Messrs. Arden and Lockett, of Manchester, England, presented before the English Society f Chemical Industry their very excellent aper outlining the laboratory results they ad obtained upon a new process of sewge treatment, which they termed "M7," nd which was subsequently named "actiated sludge," this subject has received nore study and widespread attention than ny other connected with sewage disposal.

So far as can be ascertained, there have een twenty-five experimental stations conucted to try out the process. Of these, one s located in India, seven in England, and ourteen in the United States. Seven treatnent plants have been built in America and our more of considerable magnitude have een recommended.

he Principles of the Process

No matter what type of apparatus may e used to treat sewage by the activated udge process, the process itself is essenally the same, and consists in destroying e organic matter by intensified oxidation nd nitrification. The principles are not ew, but their application is novel to the xtent that the organic solids in the sewage re used as the prime media to effect purication.

This last statement is but partially true, because in the septic process of treating sewage the organic solids are recognized as the purifying media, assisted by anaerobic bacteria. In the activated sludge process the aerobic bacteria are exclusively used, care being taken to exclude anaerobic or putrefying bacteria from all parts of the process.

The first principle employed in the activated sludge process is the effective separation of colloidal matter and solids in suspension from the water by agitation with air for a short time. The material so separated contains large quantities of aerobic bacteria, many species of which convert organic matter into harmless chemical and mineral matter. The chief aim in the design of a treatment plant for this process is to provide food and lodgment for the bacteria without an extravagant use of air, and to keep them in continuous contact with the sewage in as great numbers and for as long periods as is necessary to secure the standard of purification necessary.

To this end, the raw sewage is passed thru tanks containing a certain proportion of activated sludge, the mixture being agitated continuously by means of air injected thru the bottom of the tank. After being retained in this aerating tank for from three

THE FIRST LARGE EXPERIMENTAL ACTIVATED SLUDGE TANK IN THE WORLD, MANCHESTER, ENGLAND, 1914

to eight hours, the mixture passes into a sedimentation tank, where the solids are precipitated to the bottom while the clarified liquor passes off at the surface.

The precipitated solids form the activated sludge and, to prevent septic action, must be removed from the bottom of the sedimentation tank as rapidly as deposited. A sufficient amount of the sludge so removed to keep the ærating tanks well supplied is returned to the raw sewage as it enters these tanks, the surplus being disposed of by such means as are best suited to local conditions. The subsequent treatment of the surplus sludge is a problem quite divorced from this process of sewage treatment, altho its peculiar characteristics preclude its being as satisfactorily disposed of as are sludges produced by many other methods of sewage treatment.

Character of Sewage to be Treated

There are four different types of sewage produced from American municipalities: (1) sewage from a residential city free from industries, collected by a separate system of sewers; (2) sewage from a residential city free from industries, collected by a combined system of sewers and storm drains; (3) sewage from an industrial city with separate system of sewers; and (4) sewage from an industrial city with a combined system of sewers.

From each of these types a differen character of sewage is produced, and th treatments must be different if the best re sults are to be obtained. The sewage fron a residential city carries less suspende solids, which are of a uniform characte day after day, and reaches the disposa plant in a uniform weekly cycle. Whe storm water is mixed with such a flow, th character of the sewage is greatly change by dilution and the addition of grit. Th sewage from an industrial city carries larg quantities of trade wastes, which add to th complexity of sewage treatment. The flo is rarely uniform, and the character chang from hour to hour. When such a sewage combined with the storm water flow, i treatment is correspondingly complicated.

In designing an activated sludge plan each of these characteristics must be car fully considered, or trouble will surely fo low.

Character of Effluent Required

The question of the character of efflue required is one of the first to consider, the size of plant and the amount of air r quired depend directly upon it.

If the removal of matters in suspensi and the production of a clear effluent a all that are required, less aerating tank c pacity and less power should be provid whereas, if the effluent must also be w

nitrified, the sewage must be given a longer period of contact with the air and sludge and a greater volume of air per gallon of sewage must be used.

In an aerating tank having 15 feet effective depth of liquor, 98 per cent removal of the suspended matter can be effected with 0.5 cubic feet of air per gallon of sewage treated, applied for one hour. On the other hand, if nitrates are to be produced in the effluent, the same sewage will require from 0.75 cubic feet to 1.10 cubic feet of air per gallon applied from four to six hours.

The reason for this increase is that the agitation of the liquor by the air separates the solids and colloidal matters very rapidly, but it takes time for the bacteria contained in the activated sludge to convert the ammonia into nitrites and these in turn into nitrates.

Preliminary Processes Desirable

If the sewage to be treated contains storm water, grit chambers must be provided of such design as to effectually exclude all grit from the aerating tanks.

Industrial sewage should be fine-screened before passing into the aerating tanks. This positive statement is the result of Mr. Hatton's observation of the activated sludge process at Milwaukee for two years.

Grit in the aerating tanks settles to the bottom and rests upon the air-diffuser plates, interfering with their efficiency. All industrial sewage carries quantities of waste, fleshlings, pieces of leather, packing-house wastes, large pieces of paper and textiles of many kinds, lime and hair. The greater specific gravity of these materials causes them to settle upon the diffuser plates and interfere with effective operation. If, on the other hand, they are carried over into the sedimentation tanks, they frequently stop up the sludge draw-off pipes and valves and thus disturb the continuous operation of the plant.

In addition to the above objections, the decomposition of the organic matter contained in these articles requires large quantities of air, which is a more expensive medium than can be used in other forms of sludge reduction. It was found in Milwaukee that from 15 to 20 per cent of the air could be saved when treating sewage passing a 20-mesh screen, as compared with the same sewage passing a 1-inch grid screen.

Where a purely domestic sewage is to be treated by the activated sludge process, fine screening may not be necessary. In any case, a ⅛-inch slotted screen is quite fine enough for any character of sewage.

Preliminary sedimentation in lieu of fine screening is not applicable to the activated

SYSTEM OF AIR PIPES IN OLD SEWAGE ROUGHING FILTER IN SALFORD, ENGLAND

Used in early activated sludge experiments on a large scale, beginning in 1914

sludge process if the sludge is to be finally disposed of as a fertilizer. The sludge from such a tank contains very little ammonia, is hard to handle and mix with activated sludge, and when mixed adds to its weight without adding proportionately to its value; whereas fine screenings contain almost as much available ammonia as the activated sludge, can readily be mixed with it in the dryer, and increase the value of the mixture proportionately.

Type of Aerating Tank

Local conditions and the size of the plant may largely influence the design of the aerating tank. Simplicity of design is necessary to keep down construction cost. After the period of retention in the aerating tank is decided upon, the tank should be proportioned to give the greatest length of flow without a wasteful use of piping and concrete. A tank 100 feet long and 22 feet wide, having 17 rows of diffuser plates, will have a greater efficiency than a tank 50 feet long and 44 feet wide with 8 sets of plates, because in passing thru the first tank the liquor must pass twice as many air baffles as in the second. The second tank could be made more efficient if it were divided into two separate compartments by a central baffle wall, applying and taking off the liquor at the same end. The tanks in Milwaukee are to be 350 feet long and 22 feet wide, the liquor being applied at one end and removed at the other.

The piping system for the activated sludge process is an expensive feature and should be given due attention. All valves should be placed so as to be easily reached, and all air piping of such a type as to preclude inside corrosion. If iron rust gets into the pores of the air diffusers, their efficiency is greatly reduced. Therefore, cast, galvanized or Sherrardized iron pipe or lead pipe should be used for conveying air thruout the plant. In cold climates the air pipe should be frost-proof to prevent hoar-frost from forming inside the pipe and thus increasing the frictional resistance. This protection is easily secured by placing the pipes a few feet below the surface of the liquor in the aerating tanks.

The air diffusers may be placed in cast iron or concrete containers, preferably the latter because of the absence of corrosion. If cast iron is used, they should be coated with hot pitch, and care should be taken to place the diffusers so they will be air-tight and still can be removed without damage.

(To be continued)

American Cities Appreciate the Need for More Toluol

Letters Received Show That Officials Are Awakening to This Situation

In the December issue of The American City appeared an editorial article under the heading, "Increase the Production of Toluol or Increase Our Casualty Lists —Which?" In response to over seven hundred advance prints of this article which were sent to public service commissioners, chambers of commerce and gas companies, nearly half a hundred letters have been received. Some organizations are eager to learn what they may do to keep from falling behind in the march toward Liberty; some are eager to show that they have already been in action, and the most notable among this group is the city of St. Louis, as shown in one of the letters quoted below. There may have been many other cities which have done equally valuable work, but they have not replied.

As might well be expected, the article brought forth some criticism, and one secretary stated that he "would suppose that the Government itself would handle this matter direct." The American City has desired only to aid in giving greater publicity to the crying need for toluol, thru organizations which could help the work and in places where the public could be educated to look upon the motives of the gas companies with better understanding than has sometimes been the case when a change of gas standards was under discussion. One organization stated that The American City had intimated that "gas companies

were not coöperating with the Government in this matter," when "all utilities are not only ready, but enthusiastically willing to coöperate with the Government in this or any other military measure." THE AMERICAN CITY scarcely believes that any gas company would stand in the way of this work; its fear was rather that public opinion, as expressed by municipal and state officials, might thwart immediate and effective action for the recovery of toluol. To this end its appeal was directed more particularly to public officials. The industrial department of one chamber of commerce gave assurance that it would "make every effort to induce" the gas company to engage in the manufacture of toluol and inquired further as to "the gross and net profits to be derived from same." When this representative took up the matter with the local gas company, if he followed the suggestions in THE AMERICAN CITY'S letter, he probably found that the gas company was more than willing to undertake this work as a patriotic measure, with only the guarantee from the Government that it would not lose money.

A letter from Major General William Crozier, Chief of Ordnance, U. S. A., published in part in the December issue, appears below and forms an excellent recapitulation of the subject:

WAR DEPARTMENT
OFFICE OF THE CHIEF OF ORDNANCE
WASHINGTON

NOVEMBER 2, 1917.

Engineering Editor,
The American City.

DEAR SIR:

Answering your letter of October 29, I am glad to see that you take a sympathetic view of the efforts of this Department to expand the capacity of the country for the production of toluol, by drawing upon the resource which is offered by the gas companies.

The war in Europe has raised immensely the estimate of the value of the high-explosive shell as an artillery projectile. In all previous wars shrapnel has been the principal projectile for artillery, and has been supplied to troops in much greater proportion than shell. This war has reversed the proportions, and has not only called for the supply of high-explosive shell in much greater proportion than has hitherto been practiced, but has also greatly increased the amount of artillery fire, irrespective of the proportions of the different kinds of projectiles.

One of the most important substances used for the bursting charge of the high-explosive shell is trinitrotoluol, which, as is well known, is made by the nitration of toluol. The demand for this material is greater than the capacity of the usual sources of supply, and has made it necessary to turn to other sources. A very useful source is city illuminating gas, which can be stripped of its toluol at the expense of its illuminating quality, for which heating quality must be substituted in order that illumination, when that is the object of burning the gas, may be obtained by heating something else than that which is contained in the gas itself.

In interfering with the quality of gas, the Government at once touches something with which a great number of citizens are directly concerned, and with regard to which they have generally found it necessary to surround their interests with safeguards which have been devised and enforced by public service commissions, and these commissions are likely to be appealed to at once when citizens find that they are not going to get their accustomed service from the gas companies and have to endure a poorer quality or a greater expenditure in their consumption of this necessary accompaniment of civilized life.

I sincerely hope that such grievances as must necessarily arise in connection with a matter which closely affects so many people will be so handled and adjusted as not to interfere with the prime necessity for supplying this important shell filler, so necessary for giving to our troops their proper means for defeating the enemy.

Sincerely yours,
(Signed) WILLIAM CROZIER,
Major General, Chief of Ordnance, U. S. A.

The following letters show two instances of the fine spirit which it is hoped may become more general:

ST. LOUIS CHAMBER OF COMMERCE
510 LOCUST STREET

NOVEMBER 20, 1917.

Engineering Editor,
The American City.

DEAR SIR:

Yours of November 17 in connection with the production of T. N. T. received. This matter has already been before us and has been definitely settled and is now under way.

In order to produce our maximum of T. N. T., it was necessary to reduce the heat units in the commercial gas as now furnished. This was immediately arranged between the City Administration and the gas company with the full consent of both, and the entire proposition settled within forty-eight hours after it was presented. This is but one of a long list of evidence of the definite and immediate action taken by St. Louis interests in all matters connected with the successful prosecution of the war.

Yours very truly,
(Signed) E. GENGENBACH,
Industrial Commissioner.

THE SIOUX CITY COMMERCIAL CLUB
SIOUX CITY, IOWA

NOVEMBER 21, 1917.

Engineering Editor,
The American City,

DEAR SIR:

I beg to acknowledge yours of November 17, and to advise that the Sioux City Gas & Electric Company has for some months been shipping its tar by-product to Des Moines, where there is a refining plant which handles the material from several Iowa cities. The treated product is sent to Philadelphia, where it is further refined and presumably converted into T. N. T.

Respectfully yours,
(Signed) W. E. HOLMES,
Secretary.

It was with deep gratification that the following letter was received from Major J. H. Burns, of the Office of the Chief of Ordnance:

WAR DEPARTMENT
DESIGN SECTION—GUN DIVISION
OFFICE OF THE CHIEF OF ORDNANCE
1330 F STREET N. W.
WASHINGTON

NOVEMBER 22, 1917.

Engineering Editor,
The American City.

DEAR SIR:

The Chief of Ordnance directs me to thank you for your letter enclosing copies of the editorial which you have placed in the hands of public service commissioners, newspapers and chambers of commerce in various cities of the United States. We feel sure that this publicity will be of material assistance to the Ordnance Department in its work in connection with toluol recovery, because it will go a long way toward educating the public and municipal and state authorities to the need of recovering toluol.

Respectfully,
J. H. BURNS,
Major, Ordnance Department.
Per C. W. Hunter.

Methods and Materials for Paving Between Street Railway Tracks

Seventh Article—The Practice in Toronto, Canada

By M. A. Stewart

Roadway Engineer, Department of Works, Toronto

THE Toronto Railway Company was incorporated by an act of the Legislative Assembly of the Province of Ontario in May, 1861. After many vicissitudes and changes of ownership, the company at present operating the line obtained control in 1891, and an agreement setting out the terms was entered into with the Corporation of the City of Toronto. This agreement was ratified by an act of the Legislature in April, 1892, and exclusive rights were thereby granted by the city to operate a railway system within the limits of the city, as they existed at that time, for a period of thirty years from September 1, 1891.

It was provided in the agreement of 1891 that the company should pay to the city a percentage of the gross earnings, which increased in proportion as the earnings increased, and a flat rate of $800 per mile of single track, or $1,600 per mile of double track. Provision was also made whereby the company was obligated to furnish for new work and maintain in old work the ties, rails, fastenings, etc. The city places the foundations and pavements required.

The city was empowered by special legislation to issue "City of Toronto Street Railway Debentures," made for any period not exceeding the life of the pavements, but in no case to be more than ten years. The interest upon, and the amount of annual sinking fund required to discharge, these debentures was provided for as a first charge upon all money received from the Street Railway Company.

Types of Construction

Under the arrangements briefly outlined above, the city has, therefore, been engaged from year to year in building new lines, in coöperation with the company, or in reconstructing or repairing old ones. The type of construction used in this class of work has, of course, changed very radically from time to time, according to the demands made upon it by the increasing traffic, size of rail, weight of rolling stock, and the general conditions incidental to a growing city.

In the early days of the franchise the necessity for what is now known as a permanent pavement was not so urgent as it is at the present time, and types of pavement, the laying of which has long since ceased, were permitted. This is particularly so in the case of cedar block, of which a great deal was laid in the past.

The greatest development, however, has taken place in the foundation supporting the pavement. The early types provided for a course of gravel beneath the ties and concrete between the ties, the pavement being placed upon the ties and concrete. It will readily be seen that such a structure, permitting as it did a great deal of movement of the rail, promoted very rapid deterioration of the pavement.

A cross-section of a typical track allowance structure of 1893 is shown in Fig. 1.

It will be seen from this that after the subgrade had been prepared, a trench, 12 inches deep below the bottom of tie, was made down the center of the excavation and two rows of 2-inch tile drain placed. This trench was then filled with gravel, as was also the entire excavation, to a depth of 4 inches. Upon this gravel the ties were placed at 3-foot centers and the rails spiked thereto. The spaces between the ties were then filled with concrete, which was also carried around the ends of the ties to the outside edges of the track allowance area. Inasmuch as the ties were 6 inches in depth, the concrete was the same, with the addition of as much more on top as was necessary to insure a 1-inch cushion of sand beneath the bricks which constituted the surface of the pavement.

Immediately before laying the surface, the sand cushion was struck to a true sur-

TYPE FOR
BRICK PAVEMENT WITH 6½ INCH GIRDER RAIL
1893

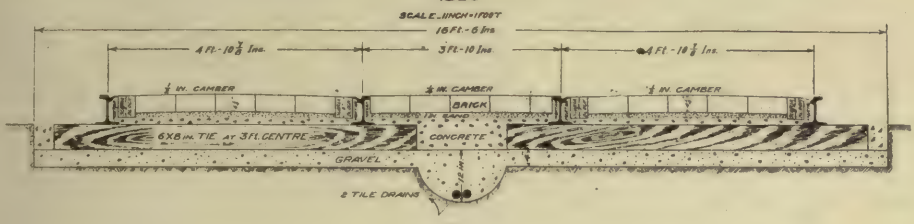


FIG. 1.

TYPE FOR
BRICK PAVEMENT WITH 6½ INCH GIRDER RAIL
1895

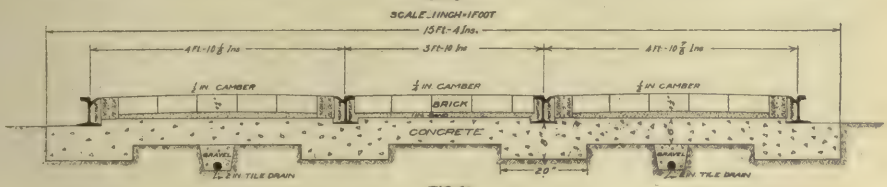


FIG. 2.

TYPE FOR
GRANITE BLOCK PAVEMENT WITH 7 INCH GIRDER RAIL
1915

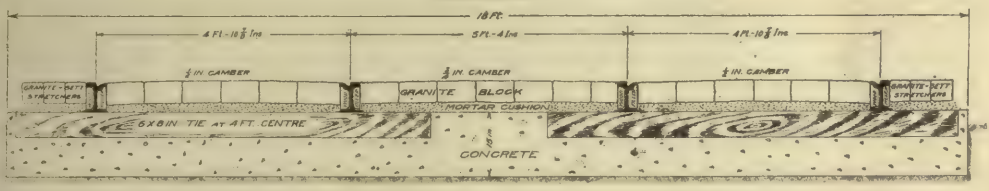


FIG. 3.

TYPE FOR
ASPHALT PAVEMENT WITH 7 INCH GIRDER RAIL
1917

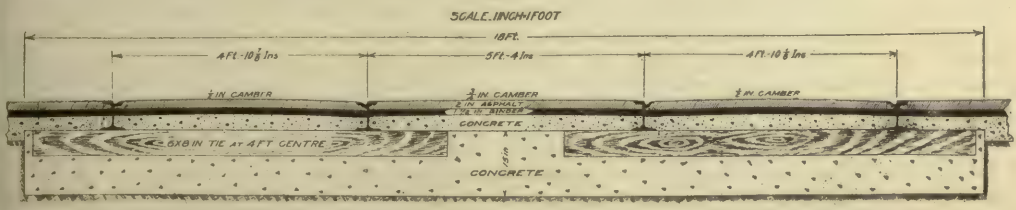


FIG. 4

THE PROGRESSIVE DEVELOPMENT OF METHODS FOR PAVING IN TORONTO, CANADA

face with a template, and the hollow of the rail filled with a very stiff cement mortar. This was so finished as to present a perpendicular face, which dropped from the outside points of the head of the rail. The laying of the pavement was at once proceeded with, a row of scoria blocks being first laid as stretchers, or in some cases alternately as header and stretcher, and the bricks then laid in courses, at right angles to the line of the work. The bricks were then grouted in the usual way. Other materials, such as cedar block, asphalt and stone block, were used on various works, but the above serves to illustrate the general practice at that time.

Radical Changes in Foundations

This method of construction in time proved very unsatisfactory, and in 1895 a radical change was made in the foundation, altho the same methods obtained with respect to the surface. Instead of placing ties at 3-foot centers and filling between with concrete, no ties were used and a concrete base was placed for the entire area of the track allowance. This base was 8 inches in thickness for a length of 10 inches on each side of the center line of each rail and 6 inches in thickness for the rest. (See Fig. 2.) This type of foundation was found to be inadequate, and it was thought that there was not sufficient weight of concrete beneath the rails. For that reason, in 1905 the foundation was changed to the extent of making that portion which lay beneath each rail 12 inches in depth instead of 8 inches, as formerly, otherwise the dimensions were the same. The laying of the pavement was carried out as has been previously described. In 1906 the track allowance was widened so that the width of strip between the tracks became 5 feet 4 inches instead of 3 feet 10 inches. This was done in order to permit the operation of wider cars. The types of pavement, however, which were available for work of this character were reduced considerably, and practically all the work laid at this time and for some years after consisted of granite block, vitrified brick and scoria block.

About this time a considerable amount of tee rail was used, which altered to some extent the method formerly adopted in paving. It was impossible, of course, to lay the pavement directly against the head of the rail, as heretofore, as provision had to be made for the flanges of the car wheels. To this end, what were known as half-and-whole flange blocks were used, and were laid alternately in order that a proper bond might be made with the balance of the pavement. These blocks, which consisted of either granite or scoria (molded slag block), were similar to the ordinary rectangular blocks, with the exception that one corner for the full width of the block was cut out for a sufficient depth and width to permit the small end thus created to be placed beneath the head of the rail and lie solidly against the web. In this way a groove was established for the accommodation of the wheel flange. The blocks were bedded in 1 : 4 cement mortar, and the mortar casing used with the girder type of rail was done away with. It may be added, however, that the use of the tee rail has for the last few years been abandoned.

The Resumed Use of Ties

The foundation just described, in turn developed certain weaknesses, and was replaced in 1911 by a slab, 12 inches in thickness, for the entire width of the track allowance area. The use of ties was also resumed, as it was found that upon those tracks where no ties had been used great difficulty was experienced in keeping the rails in proper alignment and to proper grade. At this time steel ties were first discussed, and they were tried out on certain works, being placed at 6-foot centers and secured to the rail by means of clips, bolted to the ties and overlapping the base of the rail.

Another alteration took place this year on certain track allowances, built in the most heavily traveled parts of the city, the foundation being increased to 15 inches of concrete on straight track and 18 inches beneath all intersections. This foundation was laid in two courses, the first course being 9 inches in depth and the top coming into contact with the bottom of the tie. After the concrete had set, but before it had thoroly dried, the second course of 6 inches was placed, the concrete of the first course being thoroly pounded beneath the ties and any apparent shrinkage taken up by floating in a cement grout.

The use of steel ties was also abandoned on this later work, as difficulty was experienced in holding the rails securely with the clips and in making repairs, and wooden

PLACING SECOND COURSE OF CONCRETE FOUNDATION

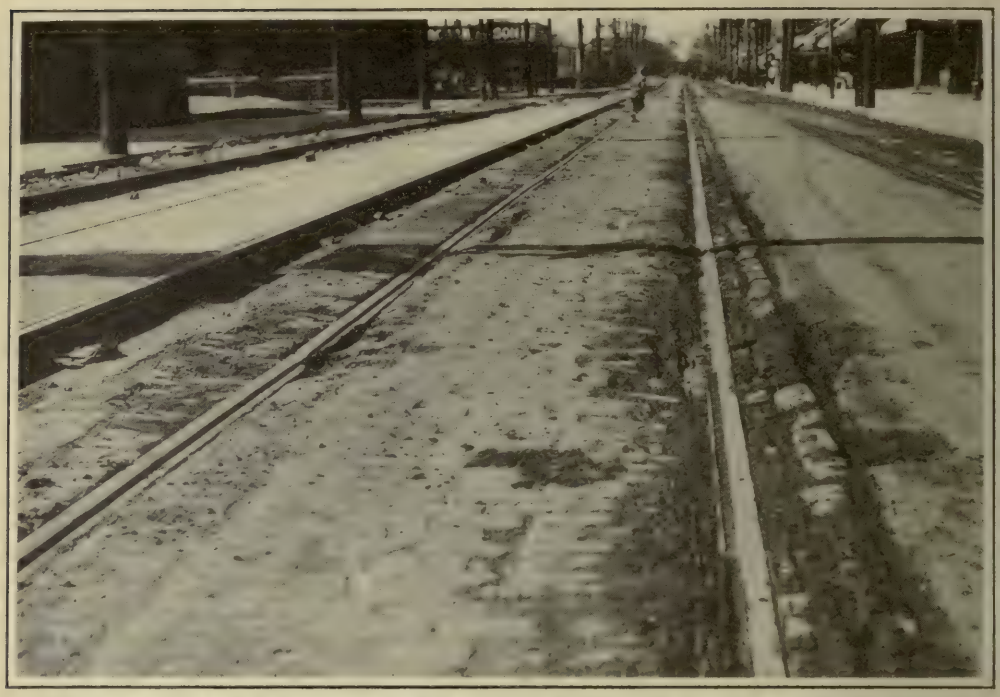
The first course, up to the base of the ties and blocks, has already been placed; temporary track seen on right

ties and beveled wooden blocks, alternately spaced at 2-foot centers, were again introduced. This foundation has been in use on all work since 1911, and at the present time there is, as far as can be seen from the excellent results obtained, no occasion for alteration.

The first use of treated wooden block for the pavement on track allowance work was in 1911, when rectangular blocks, 4 inches in depth and treated with 16 pounds of creosote per cubic foot of wood, were used. For some years following, similar material was used to a considerable extent. Difficulty, however, was experienced in some cases by the popping up of single blocks and the heaving of small sections; considerable wear in some instances also developed, and the use of an improved granite block has been adopted for the last two years. This block is well cut and presents a comparatively smooth surface, the joints being reduced by the character of the cutting to a minimum. The sand cushion, upon which pavements of this nature were formerly laid, has now been replaced with a mortar cushion, consisting of one part of cement to four parts of sand, and wood treated with creosote has been substituted for the mortar casing, with which the hollow of the rail was formerly filled. To date, probably the best results yet experienced by this city in track allowance work have been obtained by this form of construction.

In 1915 the city had occasion to construct, in coöperation with the Toronto Railway Company, a new track allowance thru a portion of the city which was not well provided with the means of transportation, and the class of pavement decided upon was wooden block, placed upon the usual foundation of 1 : 3 : 6 concrete. As the work progressed, difficulty was experienced in obtaining a sufficient quantity of wooden blocks, and eventually it was found that it would be impossible to complete the work with this material before winter. For that reason it was decided to finish the work with an asphaltic concrete surface. This was done, and up to the present time excellent results have been obtained.

This year, altho asphalt had been laid in the past with unsatisfactory results, due to



COMPLETED TRACK AT LEFT; BAD CONDITIONS BEFORE REPAIR SEEN ON RIGHT; TORONTO, CANADA

inadequate foundation, it was decided, for certain reasons, to again utilize this material on a work of considerable size, our experience with asphaltic concrete, as recited above, leading the Department to the belief that with sufficient care an asphalt pavement could be laid which would stand up under traffic in a satisfactory manner. The use of this material led to certain changes in the type of construction. That part of the foundation beneath the base of the rail did not, of course, change. Owing, however, to the fact that a 7-inch rail was used and that the thickness of the asphalt cap totaled 3½ inches, being 1½ inches of close binder and 2 inches of asphalt top mixture, it was necessary to introduce an additional slab of concrete, 3½ inches in thickness, above the ties. This was placed after the concrete foundation had set and dried out to a considerable extent, in order that the bond between the two courses should be weak, thus permitting the removal of the last course, should it be found desirable in the years to come to introduce a pavement of greater depth than the asphalt. Before placing the asphalt, after the entire foundation for it had been built, the surface of the hollow of the rail was painted with asphaltic paint. The binder and surface mixture was then placed in successive courses, care being taken to thoroly tamp the material beneath the head of the rail, before rolling. The appearance of this track allowance is at the present time excellent, and the Department has every hope that satisfactory results will be obtained by the use of this material.

Fig. 3 illustrates the most advanced type of granite block track allowance, as used in Toronto, and Fig. 4 shows the track allowance paved with asphalt, as last described.

Prior to 1912, all reconstruction work was carried on while the cars were operating over the line, and it was, therefore, impossible to obtain the best results. In 1912 arrangements were made with the railway company whereby a temporary track, with turn-outs at each end of every job, was laid.

An Argument on War-Time Continuation of Preliminary Work on Public Improvements

From a Statement Made to the City Council Committee on Home Defense, Chicago, December 1, 1917

By Charles H. Wacker
Chairman, Chicago Plan Commission

AT the outset, permit me to assure you that I am in favor of mobilizing to the greatest possible degree, the finances of this country for war needs.

But such mobilizing should under no circumstances be allowed to interfere with the work necessary to make us ready for peace.

The people have been justly blamed for being unprepared for war, and the criticism could justly be heaped upon them if they do not prepare now during war for peace.

If ever there was a time when wisdom and foresight were required, that time is now. We must, at all hazards, maintain the well-being of our people in the cities by keeping the home fires burning, and there is grave danger that the home-defense need may be neglected, to the detriment of the national situation and its ultimate success. No matter what additional demands the nation may make upon us, to conserve the health, the general well-being and effectiveness of our people in these trying times is to serve our nation with patriotic intelligence.

I am not here to-day to advocate the spending of large sums of money, nor to advocate projects which will use materials necessary for the carrying on of the war. I desire, at this time, merely to urge upon you the need of making plans and preparations for the carrying on of these great city projects at such time as the war necessities are over.

The flower of our young men, upon whose shoulders we expected to place, with confidence, the development of our country, are marching to the front. How many will return crippled, blind or otherwise incapacitated, no one can foretell.

Battling for Humanity at Home

When the war is over, thousands of our Chicago boys will return to their home city, to be confronted with lack of employment, possibly depleted in health, and requiring the work, nurture and protection our preparedness program then can afford them. And when the war is over, factories that are now making munitions, building ships and working to the fullest capacity to carry on the different branches of war industry, will have largely ceased this work, adding to the ranks of the then unemployed.

Is it not plainly the duty of the municipality to be ready at that time to carry on those great municipal construction projects which possibly could not be realized during the war, requiring the use of more money, labor and material, preparation for which must be made in advance? Prepare so that you can give workingmen employment and not make them objects of charity.

At no time in the history of our beloved city has it been more important than now to carry to speedy completion the great humanitarian and sound economic projects, for which carefully thought-out plans have been made. Our battle for humanity in the war zone should not overshadow the need for making ceaseless efforts at home.

More than ever after the war will our citizens require the health-giving privileges of more light and air in their homes and places of business, more and larger parks, more playgrounds and forest preserves, and increased bathing-beach and recreational facilities. City building is man building. Man, physically and mentally well developed, is a nation's greatest asset, and must be preserved.

France's Wonderful Example

George B. Ford, consultant to the Board of Estimate and Apportionment of New York City, who has just returned from a visit to Europe as a member of the American Industrial Commission to France, reports:

"The French Senate recently passed a law

compelling every French city to lay out all its future development along modern city planning lines. Paris, since the war began, has created a city planning bureau with broad powers, which has developed comprehensive plans not only for the entire city, but all the surrounding area. In Limoges they have just torn down six acres of four- and five-story tenements, at a cost of millions, in order to lay out broader streets and to rebuild the district along modern city planning lines.

"In Marseilles they have expended eight million dollars in replacing six- and seven-story tenements with broad streets, open spaces and modern buildings. They have realized that with the loss of a million or more of their men they must do everything they can to preserve and build up the next generation. They appreciate that they cannot afford to let it grow up in insanitary, unhealthy and disagreeable surroundings. Parks and playgrounds are also being created, because the war has shown that success in war or peace depends largely on keeping both men and women in the best physical condition."

What England is Doing

Let us look to England for guidance. In the British capital Mr. Ford states that, since the beginning of the war, they have worked out comprehensive plans and traffic routes for nearly two thousand square miles around the city.

Councillor Marr, of Manchester, England, is reported, in the November report of the Garden City and Town Planning Association of London, as saying:

"The end of the war must see an enormous expansion of activities. Pressure should be brought to bear on public authorities, national and local, to accomplish those things now, as after the war money will be in demand in too many other directions. Cities must be urged to use to the full their existing powers, and it would not be surprising if, before long, these are considerably extended, to cut away the red tape of the treasury."

Views of Chicago Association of Commerce

The following letter from the president of the Chicago Association of Commerce indicates the policy favored by that organization:

THE CHICAGO ASSOCIATION OF COMMERCE

CHICAGO, NOVEMBER 30, 1917.

Mr. Charles H. Wacker, Chairman,
Chicago Plan Commission,
Chicago, Ill.

DEAR MR. WACKER:

I have noticed in press reports that there is an apparent tendency to discourage consideration of some of the projects of the Chicago Plan Commission because of the war. I am not surprised at this, for it is in line with the suggestion made by some people in connection with other local problems. It is, nevertheless, unfortunate, because, while winning the war must be the predominant thought with all of our people, the victory will be a barren one if we have failed to conserve present worthy objects and forward consideration at least of the plans for the future.

The Chicago Association of Commerce has been giving its energy to whole-hearted support of the war problem. At the same time we have not shed the burdens of encouraging local business and civic effort. We have tried to profit by the experience of our allies. I believe that any study of the municipal and national affairs of the European countries which have been thru three years of intensive warfare, will show conclusively that part of the war program was the planning of large municipal undertakings and extension of foreign and domestic trade. The arguments in favor of such a program are so obvious and numerous that I need only mention a few of them.

Readjustment of all business which must come at the close of the war—whether that close be soon or far away—will undoubtedly make for a period of depression in many lines of business. Instead of the soldiers ready to return to civilian life having a place ready for them, there will undoubtedly be a period when in many pursuits of business there will be no opening. This will necessitate either a wide distribution of charity, or a large undertaking of public works. But unless the public works have been considered, and the preliminaries and technicalities disposed of, it will be impossible to avail ourselves of this avenue of relief. . . .

The only arguments which I have heard used to discourage consideration of public improvements are that they cannot be financed at this time, and that prosecution of this work would interfere with the vital and necessary requirements of the army and navy. The first objection—that of finance—needs no answer because the very minor expenses incidental to the preliminaries require no special financing, and the work can in most cases be done by men now employed in our public bodies.

As to the second objection, it is automatically taken care of by the priority orders of the Government. If cars are needed for transportation of war materials, priority orders will not permit them to be used for sand, gravel and building materials. If cars are not needed for war transportation, it would surely be an indication that other use should be made of them; otherwise there will be depression. If war requirements demand the absorption of all steel production, priority orders will prevent the building of bridges and viaducts. In other words, in the consideration of such matters as the future demands of Chicago, we need have no fear of interference with the war program of our nation, for the actual consummation of these improvements will automatically be impossible so long as the needs of the nation require the material, money or men.

This war will not be a real victory if our

people merely shift the burdens they have been carrying to take up burdens which they must assume by the prosecution of the war. We will be strengthened only if we continue to protect the achievements of the past, carry the burdens of the present, and retain the vision of the future.

Winning the war is the paramount issue today. But winning the war carries with it for those who remain here more than merely watching the progress of the other men who are devoting all of their time to that task. We who remain must aid them to the limit of our energies, and to do so we must give thought to their future and ours. . . .

I sincerely trust you will continue your splendid efforts to have the plans of the Chicago Plan Commission given consideration at this time by the proper authorities, not only as a local factor, but as part of the great national problem growing out of the war.

Yours very sincerely,
(Signed) JOHN W. O'LEARY,
President.

The Value of a Building Zone Plan

Under present war-time conditions of rigid municipal economy, the preparation and adoption of a building zone plan offers perhaps the best opportunity for achievement along city planning lines. Many public improvements require enormous expenditures that make them prohibitive at the present time. If these improvements could be had merely for the cost of preparing the plans, no city would consider itself too poor to have them. Zoning is an improvement equal to or surpassing in social values most of the big and costly improvements that cities mortgage their future to achieve, and yet it may be had almost without cost—merely the cost of preparing the plan. This cost is infinitesimal when compared with the immense saving to property owners thru the prevention of the destruction of property values caused by the invasion of sections by inappropriate uses. Every city has suffered enormous and utterly senseless losses thru the spotting of good residential sections with stores, garages and factories. The zone plan stabilizes values and directs the growth of the city in accord with a well-considered plan.

The zone plan of New York City * has now been in actual operation a year and a half. It is an unqualified success. There is substantially no opposition to it. It commends itself generally as a common sense measure of municipal control. Various other cities, including Philadelphia, St. Louis, Newark and Fresno, have appointed commissions to prepare zone plans. All cities of New York and cities of the first class in New Jersey and Wisconsin were authorized by the legislatures of 1917 to adopt zone plans. Much progress should be made during the year 1918 in the careful formulation and adoption of building zone plans.

* Copies of the Building Zone Resolution adopted by New York City, and other pamphlets descriptive of the plan, can be had on application to City Plan Committee, Municipal Building, New York.

American War Posters

A traveling exhibit of American war posters has been formed by the Committee on Public Information in Washington, D. C. Arrangements for its tour and the details of its handling are being made by the Free Public Library of Newark, N. J.

Do you wish to borrow this exhibit for your city? Ask John Cotton Dana, Librarian.

It includes forty American war posters, varying in size from 26 inches by 33 inches to 35 inches by 45 inches, mounted uniformly. To these have been added nineteen posters from other countries to illustrate the modern poster movement, and a group of small American poster work to make the display more nearly complete as an exposition of the work of our artists. To show them all and allow 3 inches of space between posters, 187 running feet of wall space will be required. To cover the cost of preparation, including mounting, labeling, making the traveling case, preparation and printing of list and accompanying pamphlet, a charge of $10 is made to each exhibitor.

In addition, each exhibitor will be responsible for payment of expressage one way. He will receive the posters express collect, and will, in turn, in all cases ship them express collect to the next exhibitor. The itinerary will be planned for as short hauls as possible. The exhibit may be kept for two weeks. The posters will be securely packed in one box, the gross weight not exceeding 150 pounds.

Prompt application, giving several dates in order of preference, is requested.

Poughkeepsie's Loyal Service League

Unique Organization Formed to Handle National Money-Raising Campaigns During the Period of the War

By Charles A. Simmons

Secretary, Chamber of Commerce, Poughkeepsie, N. Y.

AS in every other community, the recurring demands for the floating of the Liberty Loan issues, the Red Cross, the support of the War-Camp Community Service work, the Y. M. C. A. Fund, the Y. W. C. A. Fund, the Salvation Army War Fund, and others, impressed upon active business men in Poughkeepsie the futility of completing a new organization in each instance to carry on such work.

Methods adopted in other communities to meet such problems thru the establishment of "war chests" were studied. A particularly efficient organization had been built up in Poughkeepsie by the chairman of a committee named to raise the city's quota of the Y. M. C. A. War Fund. This organization consisted of ten teams of ten men each; practically the same hundred men who in one way or another had been called upon to handle most of the other important work demanded of loyal communities. At the conclusion of the Y. M. C. A. campaign, which "went over the top" amid unrestrained enthusiasm, there was unanimous decision to keep this body intact. It was rechristened, a form of organization was perfected and rules were adopted. Thus came into being the Loyal Service League of Dutchess County.

Each member signs the following pledge:

We, the undersigned, desiring to become members of the Loyal Service League of Dutchess County, hereby assent to the purpose of the League and declare our principles and obligate ourselves as follows:

First: The purpose of the Loyal Service League of Dutchess County is unqualified loyalty and service to the Government of the United States and its people.

Second: The cause of the United States in the present war is just and honorable.

Third: The most important business which we have or can have is to win the war, and we have the same duty as individuals to render service to the country and help to win the war as the men in our Army and Navy.

Fourth: We obligate ourselves that during the continuance of the war we will be loyal in thought, word and deed to the Government of the United States and its people and will observe all orders and requests of the Government of the United States; and that we will individually do whatever the Government asks us to do, and that we will as if men in the service, loyally and faithfully coöperate with the Executive Committee of the Loyal Service League of Dutchess County to the extent of our power. We will take no advantage of anything that might be detrimental to our fellow-citizen from his service for the Government or under this pledge.

Membership in the Loyal Service League of Dutchess County does not prevent or interfere with any line of loyal work a member is now doing or may wish to do; it does not bind him to any belief, opinion, policy or authority excepting as stated in the pledge.

The field of action of the Loyal Service League is confined to matters of national importance and patriotic service. No campaign or work is to be undertaken unless it shall be approved or ordered by the Executive Committee or unless it shall be approved at a meeting of the League and ordered by a two-thirds vote of the members present at a subsequent meeting, duly called.

The form of organization is very simple. Members of teams are known as "minute men," and each team selects its team captain. Each team consists of nine men in addition to the captain. A Council is provided, to consist of an Executive Committee and team captains. The Executive Committee consists of the chairman and eight other members.

No appeal of national character will go unheeded. The League provides a body to investigate thoroly the merits of any proposition and the application of such fund as may be raised.

If the question, "Will this help to win the war?" is satisfactorily answered, the machinery of the organization can be put into instant motion. The members of the League gather at noonday luncheons every day when a campaign is being waged, and at other times meet weekly.

EDITORIAL NOTE.—Any community desiring to study the form of organization outlined above, will receive a copy of the rules adopted by the Loyal Service League of Dutchess County upon application to THE AMERICAN CITY.

From Hand Tub to Motor Fire Truck

The Evolution of Fire-Fighting Machines in Salem, Mass.

By Katherine F. Gauss

IN the new annex of the Essex Institute, Salem, Mass., an old hand tub has the place of honor, for it has recently been returned to the City of Peace after an absence of nearly sixty-two years while in the possession of the William Penn Fire Association of Philadelphia.

This hand tub, altho not the first tub to be used in this country, is probably the oldest one in existence, and was much written of in the days of old, when hand tubs were the popular "fire wagons" and the whole town turned out to see them work.

In early times Salem was especially in need of fire-fighters, for the houses were of wood and closely built, and, as the records show, efforts were made to prevent any serious damage by flames. In 1644 the inhabitants of the town were ordered to procure a ladder for each house and secure buckets for carrying water. Later they were enjoined to have their chimneys regularly swept, and the town provided extra buckets.

The Fire Clubs

It was not until a century later that steps were taken for the organization of fire clubs, made up of prominent men of the town. These men banded together to protect their members in time of fire. It is not supposed, however, that they confined their services to club members; doubtless they turned out for any fire. The old method of fighting fire was simple enough. Two lines were formed from the fire to the nearest source of water; one set of workers passed the full buckets from one to another

SALEM'S FIRST FIRE ENGINE, THE "UNION"

until the contents were thrown upon the flames, while down the other line the emptied vessels were passed from hand to hand until the well was reached again.

The formation of fire clubs was most popular, and in March, 1749, Richard Derby and others were granted leave "to buy a fire engine," and "be a company for it," and "were excused from town offices"; one provision was, "if any one of them remove or die, his son to succeed him as a member." The engine was brought from London in 1750 and was called the "Union." It was a small affair with solid wooden wheels, and had no suction, but had to be filled from buckets.

It is hard to believe that such a little tub could ever successfully put out a fire, but it did indeed, and many a frenzied housewife welcomed it in hours of stress. It remained in the possession of one of the local hand engine companies for many years, and in July, 1866, was presented to the William Penn Fire Association of Philadelphia, at that time on a visit to Salem as guests of the William Penn Hose company of that city.

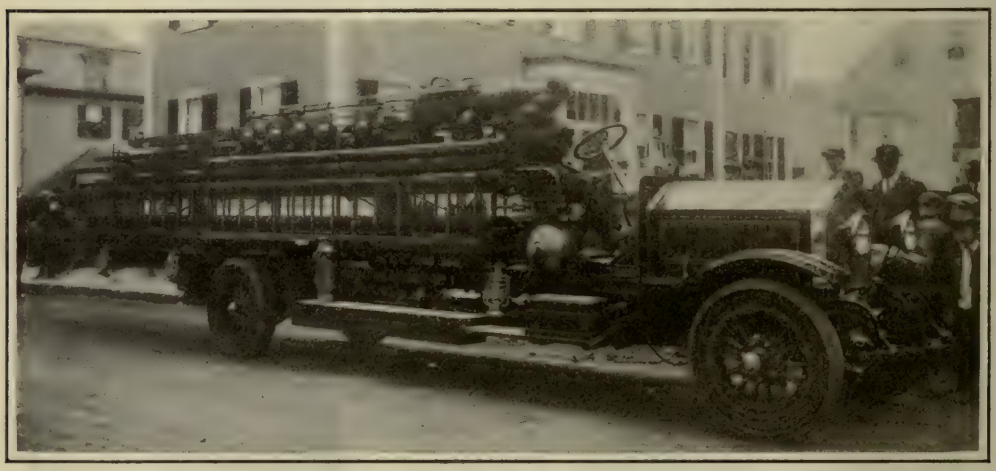
Why the Tub went to Philadelphia

The engine was presented to the Philadelphia company owing to the fact that the local hose company had disbanded, and, as no member was anxious to store the engine and it had been refused by local societies to which it had been offered, it was gladly received by the visitors. As soon as the gift had been accepted by the Philadelphia company, a great hue and cry arose in Salem, and the question of city rights was brought up.

Investigation proved the city to be in the wrong, for all records showed that the engine was the property of a private company, and was only approved by the city, and so the historic piece was borne away.

There are members of the old hand tub company still living, and when the tub was returned to Salem they went as a committee to view the little fire-piece. One of them said, "If I didn't know what the tub had done in bygone days, you would never be able to convince me that this object ever did service in fire-fighting."

The story of the disposal of the tub, as told by these men, was substantially the same, except that they showed the breaking up of the company to be due to the fact that when the first new steamer was placed in Salem, the old hand tub company asked for the privilege of running it. This was refused by the city authorities, who thought the old company was not capable of handling the new apparatus, and another company was placed in charge. Angered at this refusal, the company disbanded immediately, and, having offered the hand tub to the Essex Institute and other organizations and been refused, they finally decided to give it to their visitors, the Philadelphia company. The attempt of the city to stop its removal came to naught, and triumphantly the tub was removed.



THE LATEST ADDITION TO THE MODERN SALEM FIRE DEPARTMENT

Ever since that time effort has been made at intervals to get the tub back in Salem, the Essex Institute, particularly interested in antiquities of Essex County, being the prime mover. It was not until Chief Howard C. Kimball made repeated requests that the Philadelphia company decided to return it to its original home.

The Present Efficient Equipment

From time to time Salem added new pieces to the fire department, until it was considered that a fine equipment was theirs, but at the time of the great Salem fire of 1914, when a section of the city a mile long by one-half mile wide was burned flat, the city decided that horse-drawn fire vehicles must give way to motors.

For the most part the old horse-drawn steam engines and ladders have been done away with, and now the city has the finest fire-fighting equipment of any small city in this vicinity. The various squads of fire-fighters have been placed on the most efficient basis that has ever been known in Salem, and it is with great pride that the people view this department of the city's activities.

The comparison between the old hand tub and the present-day piece of apparatus is almost laughable, altho when it is considered that the former has done in the past proportionately as much good work as will be done in the future by the more modern piece, one turns with admiration for a second look at the "Union" as it stands in the Essex Institute, a symbol of the good old days.

Paint the Fire Escape and Keep It Clear

Timely fire warnings have been sent out by Commissioner John J. Murphy, of the New York Tenement House Department, to owners of apartment houses and tenements.

When a fire gains any headway, the first consideration should be to get people out of the building. Therefore all means of exit must be kept in order and unobstructed.

First among the means of fire egress are the fire-escapes. When a fire-escape has been placed upon a building the owner's duty is not completely fulfilled. He must see that it is kept in proper order. The chief cause of fire-escape deterioration is rust. Rust is due primarily to lack of proper painting. Rusty fire-escapes disfigure good houses. They cause a depreciation in apparent value much greater than the cost of a good coat of paint. Rust, moreover, shortens the life of the fire-escape; by weakening the structure at unsuspected points, it sometimes causes fatal or serious accidents.

The Tenement House Department finds defective fire-escapes all over the city, even on new-law houses. The law compels owners to repair or replace these. If such fire-escapes had been kept painted, the owners would have been saved this large expense. Even with the present high cost of labor and materials, one balcony and one stairway can be given two coats of best quality paint for not more than $10. By multiplying this sum by the number of balconies, owners can determine the present cost of such repairs. If rusty fire-escapes are permitted to go thru the winter unpainted, their condition in the spring will be very much worse.

Owners and janitors should see that fire-escapes are kept clear of encumbrances. In addition to obstructing escape of tenants in case of fire, these encumbrances prevent the parts of the fire-escapes from under them drying out quickly, and are often the cause of rust starting and the beginning of the destruction of the balcony. Another consideration is the depreciation of the value of the property caused by the unsightly appearance of streets in which encumbrances are allowed to be placed on the fire-escapes.

Every prudent owner and janitor should insist upon the removal of all waste from cellars and yards.

The bulkhead is provided in tenement houses as an easy means of access to the roof. Under no circumstances should bulkhead doors be locked. In order to prevent access to the building from the roof, an inside catch may be provided which can be opened only from the inside, but the practice of securing the door on the inside with a padlock is forbidden.

The City and the Coal Bins

Denver's Experience in Providing Fuel for Her Citizens

By George A. Levy
Chief of Industrial Bureau, City and County of Denver

WHEN the citizens of Denver awake these cold mornings and shiver while looking at the thermometer, noting how the temperature is gradually going lower, they send up thanks that the city has provided thousands of families with coal at a fair price and with the assurance of an abundant supply for the entire winter.

The Enabling Ordinance

As a necessary precaution against possible agitation on the part of the coal dealers and others who might be affected by the plans Mayor Speer had in mind, the full power of the legislative branch of the city government was called into effect last summer by the passage of the following ordinance, conferring ample and extraordinary powers upon the Mayor to prevent suffering among the people and the charging of exorbitant prices for food and fuel:

"*Whereas,* On account of the impossibility of obtaining a sufficient quantity of food and fuel, constituting the necessities of life, to satisfy the needs of the citizens of the city and county of Denver, there exists and is likely to continue to exist, widespread and general distress, approaching a condition of famine in said city and county, which is not being met and cannot be met by private enterprise; and

"*Whereas,* This widespread and general distress has been caused by reason of the world-wide war now in progress, by combinations to raise prices, by inability to obtain adequate supplies and by other contributing causes, so that the prevailing prices of many of the necessities of life are so prohibitive that a very large portion of the citizens of the city and county of Denver are unable to obtain them thru private enterprise, and many citizens who, in normal times, are self-supporting, are likely to become public charges; and

"*Whereas,* It is believed that the city and county of Denver can lessen this widespread and general distress by purchasing, obtaining and furnishing to its citizens food and fuel at greatly reduced prices and that this will be for the general welfare and health of the citizens of the community, and such purpose is, and is hereby declared to be, a public use.

"That during the existence of this extraordinary emergency the Mayor and his cabinet are hereby authorized and empowered to investigate and determine what particular classes or kinds of food and fuel should be obtained for relief of the citizens of the city and county, and when any such food and fuel cannot be obtained by said citizens at reasonable prices from private enterprise, and when the needs of the citizens require it, the Mayor and his cabinet are authorized and empowered to obtain such food and fuel by purchase or otherwise, and to supply the same to the citizens of the city and county of Denver at the cost of obtaining and distributing the same.

"That the Mayor and his cabinet shall have the power for this purpose to command the services of all officers and employes of the city and county of Denver that may be available for this purpose, and to employ such additional help as may be necessary, and to do all things necessary or incidental to carry out the purposes of this ordinance."

The work of securing the necessary source of supply, the system of delivery to the people, the location of coal yards for distribution purposes and the establishment of a departmental unit with proper records for a complete service to the people, were left to the Municipal Industrial Bureau.

Securing Supply and Distribution

The problem was approached, not with a desire to secure a few cars as a relief from an unusual cold snap of a few days, but rather with the purpose of securing a sufficient quantity of coal for an extended period of years. A number of visits to the coal fields of northern Colorado, known as the lignite coal district, were made by the writer, and options were secured for the complete output of the mines. The assurance to the operators that Mayor Speer intended to purchase the output for a number of years gave them a sense of security and permanence and made it possible to secure contract prices in the options low enough to allow the mine owner and operator a fair profit, and yet when all other factors of freight, delivery and overhead expenses had been taken into consideration, to sell a good quality of selected lump coal from this field to the people of Denver at the modest price of $4.15 per ton, while the prices in the local market were ranging from $6 to $6.50 a ton, with the prospect of going considerably higher.

From the many options secured, contracts were finally made for the entire output of three of the better mines. These were known in the district as independent mines, not connected with the local coal trust. One is a splendidly developed, fully equipped mine of large capacity, and another required only the installation of a railroad siding to facilitate direct shipments to the city. For the laying of the track for this siding, the city advanced a small amount of money, and for the third mine a like amount

was advanced for additional machinery and equipment to increase the output of the mine. Provision was made in the contract for the return of these small advancements by deducting a fixed sum from each ton of coal mined. This money is practically the only outlay that the city has made in furnishing the people of Denver with coal for the next few years, and all of it will be refunded in a few months. As the plan developed and the contracts for the outputs of the mines were ratified, the problem of coal deliveries and the necessary equipment and service, such as standard scales, offices, telephones and clerks, loomed up. A solution was discovered that obviated the necessity of the city having to spend a single dollar in securing yards and equipment. By an arrangement with a local coal company interested in one of the mines with which the city had made a contract, three well-equipped coal yards were rented by the coal company, standard scales, telephones and other equipment were installed, and the yards were placed in charge of competent help at the expense of the coal company.

An additional contract was entered into with a large coal delivery firm to deliver all the coal from the various yards to the homes of the people, the cost of delivery being paid by the company which had equipped the yards to handle the city's business, out of the total price of $4.15 per ton. Thus the plan was completed, the city having the output of mines, fully equipped coal yards and a complete delivery system of trucks, wagons, horses and men without investment or overhead expenses, delivering coal direct "from the mine to the bin" with none of the taxpayers' money permanently invested and without the usual cry that municipal ownership is expensive and unprofitable.

How it is Working Out

Early in the investigations of the food and fuel situation by the Municipal Industrial Bureau, a cloud of opposition appeared upon the horizon, but operators and dealers soon realized that the Mayor was in earnest. In a very short time they changed their attitude and sent an offer of help in the way of 50,000 tons of coal to be delivered by them to the city in the event that the city mines should be unable to meet the popular demand upon the Industrial Bureau.

From the opening day of the coal department, orders have been taken in a room set aside in City Hall for the convenience of the citizens in the downtown section of the city; orders also have been taken at the offices of the three municipal coal yards. The orders increased from day to day until, after three months' business, approximately 4,000 individual families had been furnished with coal, ranging from one to three tons per family. Not a single complaint has been received as to the quality of the coal, while thousands of expressions of gratitude and satisfaction have come to the Mayor and to this office in appreciation of the service that is being rendered. Each day finds more and more of the citizens availing themselves of the great saving they are making in the price of coal.

In addition to supplying families of moderate means with coal, the coal department is also supplying municipal buildings and institutions with all the coal they use, at a great saving below the price which had been paid to the local coal dealers. The coal department has now become an integral part of the Denver city government. Among the buildings furnished with coal by the new coal department at a saving of the taxpayers' money, are the following: Berkeley Park, Washington Park, Platt Park, and Montclair civic buildings, Elyria Playgrounds, City Park skating rink, barn, golf links, greenhouse and shops, Detention Home, Harmon Hall, Highway Department barns, street cleaning barns, city market, Nurses' Home, County Hospital, City Hall, auditorium, bath-house, Court House, fire houses, county jail, asphalt plant, Steele Hospital, county farm, municipal lodging house and Euclid Hall.

In addition to the regular coal service, the city opened branch offices at the municipal lodging house and the municipal bath-house, where sacked coal, in lots of 50 and 100 pounds, is sold to the very poor person who is unable to save enough to buy a ton at a time, or to the citizen caught by a cold snap with an empty bin. These sacks sell for 10 and 20 cents, or at the rate of $4 a ton. In this case the city sells at a trifle less than cost, but the same service, furnished by private dealers, brings the sale price of a ton above $10.

Civic Work of Educational Institutions

Elastic Schoolhouses

The School Plant Units in Fresno, Cal.

By Harold F. Hughes

A SCHOOLHOUSE that will grow with the community is, of course, the ideal for an American city, but it was only in the days of fairy stories that houses could enlarge and shrink at will, so something more modern must be devised. In the magazines we see bookcases advertised which will grow with the library, and in Fresno, Cal., the same plan is being used in building schoolhouses.

The unit of any school plant is the schoolroom, and W. D. Coates, Jr., drew the plans for a model unit and then passed on to other architects the business of combining these units to fit the different districts. To provide for the lighting, one side of the room is almost entirely of glass. These windows open outward to the horizontal, making the room practically an open-air school. On the other side is a row of high windows which may be opened for a free current of air, so necessary to a school in a hot climate. The blackboards are of slate, and the chalk tray has a screened cover on which the erasers rest, letting the chalk dust drop thru to the tray, there to remain until washed out by the janitor. Above the blackboard runs a strip of cork matting 18 inches wide. This gives the teacher an opportunity to display work without violating the ruling against a pin-and-tack-speckled woodwork. In one corner of the room is a large bookcase with glass doors and closed compartments, in which may be hidden the odds and ends of the day's work.

One of the best features is the cloakroom with its many conveniences for pupil and teacher. It is entered from the classroom and not from out-of-doors. Pupils come into the classroom, enter the cloakroom by one door, pass thru, leaving their hats and wraps, and come into the classroom again by the other door. As the

THE WASHINGTON SCHOOL, FRESNO, CAL.

PHILLIPS UNIVERSITY LIBRARY

THE WEBSTER ELEMENTARY SCHOOL IN FRESNO

teacher can lock her door when she leaves the room, no child can go into the cloakroom without being seen, and this does away with the possibility of disappearing lunches. Extending the full length of the room is a shelf for hats or lunches, and suspended under it is a pole to which the coat hooks are attached. By this method wet cloaks are kept away from the wall and given an opportunity to dry. Here are also large locked cupboards for supplies and a smaller one in which the teacher may keep her personal effects.

In placing the buildings, the play feature has been kept in mind, and this type of school makes possible a large playground. The buildings are placed at the edge of the grounds, and the rest of the entire block is unobstructed. The thin line of rooms opens out upon a concrete corridor on the playground side, and the windows high up under the arches are absolutely protected. Children do not have to play in constant fear of breaking a window.

Buildings only one room thick are a slight shock to the mind accustomed to the old-fashioned block house that used to be built for a school, but there are many points in favor of the sectional type. The Fresno Board of Education placed its schools so that they will not overlap each other's territory, and as the number of pupils grows, the architecture will permit the addition of one or more rooms at any time. The entire playground may be enclosed in a square of building, should so much room ever be necessary. A bond issue of $450,000 was spent on these buildings and sites, and, while it could not build all the schools necessary, it made a start with the right kind of buildings so that the work would never have to be undone.

Two of the buildings are illustrated. The Webster Elementary is a brick and concrete schoolhouse, two stories in height, built at a cost of $55,000. It contains thirteen classrooms—six on the lower floor and seven above. All rooms open independently on the corridor, and three concrete stairways assure a quick emptying of the building. In fire drills every child is out in less than a minute after the sound of the gong.

In addition to the classrooms, there is a principal's office and reception room at the center entrance and across the hall are a library and a medical room fitted up to handle school emergencies. Back of these rooms is a wing containing a supply room, a teachers' lunch room and a kitchenette equipped with gas and electricity.

The Washington Intermediate houses the seventh and eighth grades and cost $110,000. It is built on the same plan as the Webster, has fifteen classrooms, an art room, a sewing room and a cooking room, and a basement fitted up for manual training. It also has a large auditorium capable of seating nine hundred. In the rear is a motion picture booth equipped with the latest-type projector, and visual instruction is a weekly feature. The balcony has fixed seats, but the lower floor has movable chairs, so that the space can be cleared for games and like activities.

Both buildings are heated by oil furnaces. The air is washed and pumped over steam pipes to the rooms, where the temperature is regulated by thermostats. The furnaces are fool- and trouble-proof, and need little attention beyond being turned on and off.

The School Community*

How It May Develop Virtues Necessary to the Highest Type of Citizenship

REAL civic pride leads one to guard against everything detrimental to the character and reputation of a community, and to further everything that tends to build up a worthy and admirable community life. Such a pride in the school community can be cultivated from the outset. A beginning is made by protecting and enhancing the beauty of the schoolroom, the buildings and the grounds. Closely allied to this is respect for public property and for public officials in the lawful discharge of their duties. Out of this grows a disposition to be orderly and law-abiding.

When these qualities become characteristic of the school community, the individual pupil whose action is not in conformity with these ideals will be opposed by the general sentiment of his school associates. This community habit is a very powerful influence in molding the character of the immature individual. It is in the failure to develop this influence to the fullest extent that the school has not measured up to its possibilities. Take, for example, the case of cheating in examinations. Is it not first of all an offense against the school community?

A false application of the principle of personal loyalty sometimes leads students to shield others in these practices, even tho they disapprove of their conduct. Personal loyalty should be exercised for the good of the individual and should not clash with loyalty to the best good of the community. It is, then, the one that cheats who is disloyal, and the one who would protect him in this act shares in his disloyalty.

The habit of making loyalty to the public welfare the first consideration, regardless of personal cost, is one of the most desirable qualities in a citizen. Can this quality be developed most successfully if entirely neglected in the school? It is easy for public officials to prosecute members of the so-called criminal classes. The test of their moral courage comes, however, when there is occasion to prosecute wrongdoers who happen to be in good social standing. This sort of moral courage needs the active support of all good citizens. The habit cultivated in some student communities of tolerating lawlessness and shielding offenders from punishment is poor preparation for citizenship.

This condition sometimes comes about because of want of coöperation between teachers and students. The former may assume all authority and responsibility and expect the students to be instruments in their hands. But students want to be more than mere instruments; they want to be agents, and to this end may form gangs that can initiate something, even tho it be in opposition to law and order.

Such evils can be avoided by coöperation of all the members of the school community. Ultimate authority and responsibility must rest with school officers and teachers, but that is not to say that students may not share in this authority and responsibility. It is as much a part of their education to do so as it is to complete courses of study. To this end various forms of student self-government have been developed, and, in some instances, carried out with marked success. The fate of the plan depends upon those who operate it. It will not succeed without intelligent, active coöperation on the part of all concerned. Opponents of student self-government have objected on the ground that it is, after all, not self-government at all, since the school authorities reserve the right of veto on all acts of student officials. The same objection might be raised against the usual form of territorial government in America, where Congress reserves the right of veto. On this account, however, citizens of territories do not regard their local government as of no value. Under normal conditions there is seldom occasion to exercise the power of veto, either in territorial or in school government. The delegated authority is usually freely exercised in the interests of order and progress, and the responsibility of governing develops capacity for still further responsibility and sovereignty.

---

* From a chapter in "Citizenship," by Milton Bennion, Dean of the School of Education, University of Utah, published by the World Book Company; reprinted by permission.

Conciliation and Arbitration in the Municipal Court of the City of New York

A New Sphere of Usefulness for the Progressive Modern Court

By Edgar J. Lauer

One of the Justices of the Court and Chairman of the Committee on General Welfare

IN its final analysis, a court trial is a battle. People who fight are apt to get hurt. This is true, whether the fight be on the battlefield or in court. Appreciating this situation, the judges of the Municipal Court of the City of New York have secured a new method of disposing of the great mass of disputes and contentions that ordinarily are brought to court. Rules providing for conciliation and arbitration have been adopted pursuant to authority vested in the justices of the court by the Legislature of the state.

The Distinction Between Conciliation and Arbitration

Conciliation can occur only where parties, thru the mediation of a third party designated a conciliator, voluntarily reach an agreement in respect to their dispute. The conciliator seeks to bring the parties into an accord. He may make suggestions, but the parties themselves must finally agree upon the settlement of the dispute. If they fail to agree, the conciliation proceedings fail. A party cannot be forced to accept the suggestion of the conciliator. He is free to litigate his dispute in the courts in the regular way or he may consent to an arbitration. In an arbitration proceeding, however, the parties agree in advance to submit their dispute to a third party designated the arbitrator and to be bound by the decision of the arbitrator. The decision of the arbitrator does not depend for its enforcement upon the accord of both parties, once the proceeding is under way. Both parties are bound by the decision of the arbitrator, even tho it radically differs from the contention of one of the parties and is in fact displeasing to that party.

Under the rules for conciliation which have recently been adopted by the Board of Justices of the Municipal Court of the City of New York any person having a claim may apply to the clerk in any district for the issuance of a notice of conciliation. This notice is addressed to the party against whom the claim is asserted, and is to the following effect:

> John Doe, residing at ....., having presented a claim against you for ..... (say, money loaned) amounting to ..... dollars, you are hereby requested to appear before a justice of this court at the court house of the ..... district, Borough of ....., situated at ....., on the ..... day of ....., 19.., at .... o'clock, for the purpose of an amicable adjustment of the controversy.

The clerk immediately fixes a date for the hearing and informs the applicant of the date, and at once mails notice to the adverse party at the address given by the applicant. At the appointed time the parties are received by the justice in his private office. The parties are heard informally by the judge, who endeavors to effect an amicable and equitable settlement of the dispute. Frequently the parties do not know the law which is applicable to their dispute. The justice may tell them what the law is, or perhaps he may make a suggestion for a settlement which may not be in accord with strict rules of law. In taking the statements of parties, the justice is not bound by the rules of evidence which apply in court. He may receive any evidence that seems to him proper. If the parties agree, the justice notifies the clerk what the terms of the settlement are. The clerk makes a record thereof, but no judgment is entered. It rests with the parties to live up to the agreement of settlement which they have made.

Under the arbitration rules adopted, parties may submit for arbitration any controversy which exists between them, either to a justice of the court or to any other person upon whom they may agree.

This procedure, which permits a dispute to be submitted for arbitration to a justice of the court, is a novel one. It overcomes one of the objections which has been urged

against the system of enforcing arbitration clauses which require disputes to be arbitrated by a man who perhaps may be inexperienced in that character of work. Thus it has been said that men have greater faith in judges with their long training in the settlement of disputes and the conduct of hearings thereon than in merchants who bring no such qualification to the task, and, that no arbitrator other than a judge can command the same confidence and respect that a judge who is known to be independent of the parties does. If the parties, however, prefer to have their disputes settled by some other person upon whom they agree, they are permitted to do so under the liberal rules just adopted. Parties having confidence in one judge rather than in another may submit their dispute to the judge in whom they have confidence. Parties desiring to arbitrate must sign a consent in the following form:

We, ..., residing at ....., and ....., residing at ....., hereby designate ..... as arbitrator to hear and determine the following controversy between us, viz.:

(Here state the facts constituting the dispute.)

We agree that the arbitrator proceed in accordance with the rules of the Municipal Court of the City of New York, and do hereby declare that we know said rules and that we will abide by them.

.....

.....

Dated, ..., 191..

The arbitrator must forthwith proceed to hear the controversy. He is not bound by the rules of evidence. He may receive any evidence which seems to him equitable and proper. Either party may be represented by counsel. The rules provide that no record shall be kept of the proceedings before the arbitrator, but this may be waived, and, if the parties prefer, a record may be made by the court stenographer if the proceedings are had before a judge. If a justice of the court is arbitrator, the proceedings are absolutely without cost to any party, the rules specifically providing that no expense shall be incurred except upon consent in writing of the parties.

Another and most important rule which has been adopted provides that after the first hearing neither party may withdraw from the arbitration unless both parties consent or the arbitrator directs a discontinuance of the proceedings. After the hearings are concluded, the arbitrator makes his decision in writing and files it, together with any opinion he may render, with the clerk. The clerk thereafter enters the judgment on this award of the arbitrator, unless the parties agree that no judgment shall be entered.

This, in brief, is the story of the method for the amicable and expeditious disposal of litigation which is now available to any litigant in the Municipal Court of the City of New York. To the busy wage earner, shopkeeper or merchant who desires to save his time and the time of his witnesses in waiting in court until his case can be reached in the regular order upon a long and congested calendar, this new and inexpensive method is now open. The arbitrator, upon the request of the parties, may fix any hour of the day which is agreeable, when he will dispose of the matter in dispute. The present organization of the court is made by these new methods adaptable to the requirements of a busy people. We have created a new method to make the advice of Abraham Lincoln effective: "Discourage litigation. Persuade your neighbors to compromise whenever you can. Point out to them how the nominal winner is often a real loser—in fees, expenses and waste of time."

The contested court trial almost invariably leaves one of the parties dissatisfied. Almost without fail the parties to the controversy become and remain enemies. The result of a conciliation or arbitration proceeding is far different. The proceedings are conducted in an impersonal manner conducive to the resumption of friendly relations after the disposal of the dispute. There remains none of the bitterness of a hotly contested trial. The dispute may be merely the result of a misunderstanding which a frank and open statement of the parties promptly clears away. Experience in other jurisdictions has demonstrated that a discharged employe may be reëmployed or an interrupted business relationship may be resumed where a dispute is adjusted without the bitterness left by a fight in court. A spirit of good will and friendliness is encouraged in place of a spirit of hostility and enmity. I hold this to be the most important result of the new court procedure.

Under this heading there will be published during 1918 *in* THE AMERICAN CITY *a series of articles on Central and South American municipalities, thru the courtesy of the Pan-American Union. The Pan-American Union is the international organization, with headquarters at Washington, D. C., maintained by the twenty-one American republics for the development of good understanding, friendly intercourse, commerce and peace among them. The second and third articles of this series will deal with municipal conditions in Rio de Janeiro and Montevideo.*

Buenos Aires: The Metropolis of the Southern Hemisphere

BUENOS AIRES, capital of Argentina and metropolis of the southern half of the world, is situated on the right bank of the Rio de la Plata, which at this point is about 28 miles wide. The municipality has an area of about 46,570 acres and is larger than Paris, Berlin or Vienna. In population it is the largest Spanish-speaking city and ranks tenth among the cities of the world.

The growth of Buenos Aires during the last sixty years has been remarkable. In 1852 the population was but 76,000; on December 31, 1913, it was 1,484,010. The cosmopolitan character of the city is indicated by the census of 1909, which showed that of the population (1,231,698) of that enumeration 561,985 were of foreign birth. The chief factors which have caused this rapid increase in population are the constant influx of immigrants; the high birth rate (34.16 per 1,000 in 1913); and the very low death rate (14.61 in 1914).

The City Government

The municipal government of Buenos Aires is composed of two branches, the legislative and executive. The former is known as the *concejo deliberante,* corresponding to what is generally called the "city council" in the United States, and consists of twenty-two councilors elected by the taxpayers for a period of four years, half of the council retiring by rotation every two years. The members of the council serve gratuitously, and to be eligible to a seat in this important body a citizen must be over twenty-five years of age, be a registered voter, able to read and write, must have paid into the municipal treasury a direct tax or license for some industrial or commercial business to the amount of not less than 500 pesos paper (about $212.50 U. S. currency), or be a practitioner of one of the learned professions, and must have been a resident for not less than one year.

In the case of a foreigner, additional requirements provide that he must know Spanish, have paid not less than 1,000 pesos ($425 U. S. currency), and have been a resident for not less than five years. To be a qualified voter the citizen must be of lawful age, know how to read and write, have personally presented himself for registration, have paid not less than 100 pesos ($42.50 U. S. currency) in taxes or license fees, or be a practitioner of one of the learned professions, and have resided in the city for not less than one year prior to his registration. In case he is a foreigner he must have been a resident for not less than two years, and must have paid not less than 200 pesos ($85 U. S. currency) in taxes or license, or be a practitioner of one of the

116343

learned professions. The council meets on January 1 each year and appoints its own president and two vice-presidents; it holds two sessions yearly of three months each.

The head of the executive branch is the *intendente municipal,* or mayor, who is appointed by the President of the Republic, subject to the approval of the Senate. He holds office for three years and is eligible for reappointment.

The Responsibilities of the Council

The administrative functions of the council relate to finance, public works, public health and public morality. In its jurisdiction over the financial matters of the city, the council determines the taxes to be levied and fixes fines up to 500 pesos for infractions of law. To meet special expenditures, the council, with the approval of two-thirds of its members, may contract a loan so long as its indebtedness does not exceed 20 per cent of the assessed valuation of the city's property. Should a loan exceeding that amount be required, the sanction of the National Congress must be obtained. In regard to public works, the council is responsible for the construction of streets, aqueducts, bridges, sewerage systems, parks and open spaces, and the care and preservation of all municipal works. Under the heading of safety, health and public morality such matters as lighting, street cleaning, disinfection, approval of plans for the construction of private as well as public buildings, stands for public vehicles, use of streets for tramways and railroads, are included.

After an ordinance has been passed by the council it is submitted to the intendente for his approval. Should this not be forthcoming, it is referred back to the council within a period of five working days for reconsideration. Should that body confirm its previous action, it becomes the duty of the intendente to proclaim it as a municipal ordinance. In case of neglect of duty, malfeasance in office, or other improper conduct on the part of the intendente, the council, by a two-thirds majority, may bring about his dismissal from office.

Coöperation of the Municipality with the Federal Government

Buenos Aires, in addition to being a municipality, is also the capital of the Argentine Republic, and as such has an intimate connection with the Federal Government. Thru the intendente, matters pertaining to the welfare of the municipality are presented to the National Congress whenever necessary, and he likewise, as the representative of the National Government, is empowered to present to the municipality

THE PASEO COLON, ONE OF THE MOST BEAUTIFUL BUSINESS STREETS IN BUENOS AIRES

THE PLAZA LIBERTAD, ONE OF THE 97 PARKS IN BUENOS AIRES

matters affecting it that have originated in Congress. Other manifestations of this dual character of the city are to be found in the matter of the police and fire departments, which are under the control of the Federal Government, which also meets the expenses of these departments.

The sanitation of the city is looked after by two organizations, one being national and the other municipal. The former is called the National Department of Hygiene; the latter, the Assistencia Publica, or Public-Aid Service. The national body controls those conditions that directly affect the whole country by virtue of the city's being the usual gateway to the entire republic. Its functions are similar to those of the Marine Hospital Service of the United States. It looks after sanitary matters at the port, regulates vaccination, inspects drug stores, calls the attention of municipal officers to unhygienic conditions it finds in the city, aids the authorities in cases of epidemics, and performs certain functions in regulating hospitals and other charitable institutions. The Assistencia Publica has charge of all institutions of public aid; it has charge of the municipal laboratories, conducts the bacteriological examinations and the disinfecting activities, and is in active control of the relief ambulances, which are ready for all emergencies and are exceptionally efficient in case of accidents and public casualties.

The public school system is under the authority and supervision of the National Government. There are primary, secondary, commercial, industrial and university institutions. Primary education is free and compulsory for children from six to fourteen years of age, and is under the direction of the National Council of Education, which is supported by funds from the national treasury and from those derived from certain municipal taxes. For higher education the University of Buenos Aires offers courses leading to the doctor's degrees in literature and various professional degrees, while there are numerous fine arts schools and special institutions for the deaf, dumb and blind. The city is well supplied with libraries open for the use of the public.

Streets, Buildings and Parks

The city is laid out on the "chessboard" plan—i. e., its streets intersect at right angles and the blocks are 130 meters square (about 400 feet each way). At every corner the names of the streets are plainly

printed on enameled iron plates in white letters. The streets are paved, generally with granite blocks set in mortar, altho recently macadam and asphalt have come into use. Of the streets used for business purposes, the Avenida de Mayo is the most renowned. This splendid boulevard is over a mile in length and about 120 feet wide; it extends from the Plaza de Mayo to the capitol, or Palacio del Congreso, and along the middle in a double row are suspended on artistic iron poles the arc lights, while on each side near the curb of the 20-foot sidewalk is planted a row of fine trees extending the entire length. The main feature of the avenida, which strikes the stranger at once, is the uniformity in height and the fine architecture of the buildings which line it. Few of the buildings are over six or eight stories in height, and all are new and of modern style, with artistic fronts.

In this connection it may be stated that the municipal authorities have organized a commission for the encouragement of architecture in the business as well as the residential parts of the city, and a prize—a gold medal and diploma—is offered each year for the most attractively designed structure erected. Also, the owner of the building is relieved of the payment of the taxes that would be ordinarily assessed against the property for a specified time. The building line and the height of the structure relative to the width of the street are carefully established and the law regarding them strictly enforced.

There are 97 parks, promenades and plazas with a total area of about 2,660 acres. The most extensive of these is the Parque 3 de Febrero, situated at Palermo. This is perhaps the most popular and fashionable resort of the city, reached by a splendid driveway and only about three miles from the business center. The park contains beautiful avenues, winding roads, artificial lakes, and something over 1,000,000 plants and trees of great variety. Not far from this park is the zoölogical garden, one of the finest examples of landscape gardening to be met with in South America.

The principal square of the city is the Plaza de Mayo, on which front the Government Palace, the Banco de la Nación, and the historic Cathedral. Leading from the north side of this plaza is the Avenida de Mayo, where are to be found some of the largest and most modern hotels, cafés, restaurants and business houses of the capital.

Public Utilities and Revenues

The water supply and sewer system of the city are virtually departments of the National Government, and the cost of maintenance is paid from the national treasury. Water is taken from the Rio de la Plata far enough up to avoid any chance of pollution, the supply being obtained from wells that were bored beneath the surface of the river and then pumped to central stations in the city. Here the water is purified by sedimentation and filtration, and is then distributed to all parts of the city. The sewerage system may be described in general terms as that of discharge into the Rio de la Plata far below the city, whence it is carried out to sea without contaminating any of the intakes. It is elaborately devised, having the most modern equipment, and, as gravity is not sufficient to carry off the sewage, a scientifically arranged plan of pumps and relief sewers is brought into use and makes the service thoroly efficient.

The public lighting of the city is effected by four different systems, viz., gas, kerosene, alcohol and electricity. In 1916 there were 17,719 gas lamps, 3,203 kerosene lamps, 2,435 alcohol lamps, and 7,415 electric lights, of which 5,108 were arc lamps and the remaining 2,307 were incandescent lights of 50 or more candle-power, 1,120 of which were 1,000 candle-power or over.

The street railway system is excellent and for one fare of 4 cents and a fraction a person may travel from one end of the city to the other, while the rates for publi conveyances are very reasonable. Durin the year 1913 the daily average of pas sengers carried on the street railway amounted to over 1,110,000, and in order t relieve this congestion of traffic the cit undertook the building of a subway systen During 1914 this subway transported 28 514,462 passengers, while the street rai ways transported a total of 370,911,74 figures which will give some idea of tl tremendous stream of people constantly c the move in the metropolis of Sou America.

The municipal revenues of the city a derived from various sources, which may divided into five classes: (1) Reven

Copyright, Newman Travel Talks and Brown & Dawson, New York

THE BUENOS AIRES WATER-WORKS PALACE

other than that resulting from direct taxation, such as charges for paving, installing sewers, making official chemical analyses, admissions to the zoölogical garden, which is owned and managed by the city, advertising permits, and similar concessions; (2) charges on private property and municipal enterprises, such as slaughter-houses, markets, crematories (for refuse), cemeteries, property leases and the national lottery; (3) direct taxes, including municipal licenses; (4) indirect taxes, such as those for inspection of buildings, control of weights and measures, and tax on admissions to race courses; (5) incidental receipts of a miscellaneous character.

The city has grown to be an important manufacturing center in many lines. The growth of the manufacturing industries in the period from 1904 to 1914 is shown by the fact that the Argentine capital is not only a great port from which issue enormous quantities of foodstuffs that go to almost every corner of the world, but it is also a very beehive of industries that as yet are but at the starting point. Given cheap fuel, it is only a matter of a few years when the energies of the people will turn out manufactured products that will in great measure meet the ordinary domestic demand, and in some lines furnish even large quantities for export.

Save Coal by Reducing Water Consumption

Coal Is Needed for the Prosecution of the War More Than for Pumping Water for Excessive Consumption

"ONE hundred gallons per capita daily" has been the slogan of many of our cities when they have wanted to reduce the quantity of water consumed within their limits. As an economic measure, there has always been a need of reducing the amount of water consumed in some cities. Often the source of supply has been greatly depleted by improvident use on the part of citizens, or by leaks unknown to the officials. To-day the country is beginning to look upon all economic steps in the light of necessary war measures, altho this view is not held as seriously or as generally as it should be. Every sinew of the might of this country must be bent to stop the war, not with pacifism, but with reasonable economic measures which will enable the Army and Navy to push the conflict to an end satisfactory to lovers of freedom.

There are many cities and towns that are not even within the limit of "one hundred gallons per capita daily," for their consumption of water reaches as high as 300 gallons. The object of this article is not to question the value of the "one-hundred-gallon" theory in relation to the comfort and cleanliness of America, as it may be better for one city to use 125 and another 60 gallons, but we must make sure that we are not consuming water any more rapidly than is absolutely necessary, particularly where it must be pumped. We shall not reach the point where water will be as scarce as sugar and we shall have to conserve in the matter of bathing, but we may be obliged to reduce the water pressure because there is not coal enough on hand to keep the pumps running at higher rates. This will be a menace to our homes, to warehouses and to buildings in general, for then the ever-present firebrand agent from the land of the Hun will revel in his dastardly work.

What the Citizen May do

Every citizen in this country should make sure that he is not wasting any water in his household. Wasting includes permitting the water to run unduly for purposes of refrigeration and permitting a small leak to continue for weeks when by stopping it at once the householder will save money for himself, his city and his country. In cities which are not metered the householder is not really sure whether he is using less water this month than last, but this does not excuse him from taking all steps within his means to aid in reducing his city's coal consumption. If he lives in a city which meters all or most of the water used, he can check up his consumption and find out whether he is doing his share in the community saving by using less water.

What the City Can Do

Municipal patriotism can be shown in more ways than one. The fiery, noisy kind seen on the Fourth of July is one type, the enthusiastic send-off of the boys in the National Army is a second. There is, however, a brand of patriotism that does not show on the surface and that does not appeal to the ear. When the war is over and everyone is taking account of stock, the city that has quietly investigated its own weaknesses, reduced its own expenses judiciously, looked into the reasons for the excessive use of water, and has finally taken steps to eliminate the trouble even at considerable expense—this city will be among those whose names are on the honor roll of the nation.

A more general installation of meters will often solve the trouble and a water waste survey will awaken the populace to the past errors of the city and show them that there is a genuine brand of municipal patriotism alive in their home town.

Examples of Possible Savings

Among the cities which have unduly high per capita consumptions of water and which depend largely upon pumping for their supplies are Buffalo, N. Y., Chicago, Ill., Philadelphia and Pittsburgh, Pa. These are the larger cities in the group, where the quantities of coal which might be saved are greater than would be the case in cities

lesser population with an equal per capita consumption.

In a paper read before the Chicago Chapter of the American Association of Engineers this last year, John Ericson, City Engineer, made the following quotation and statement which bears very closely on the question of saving water:

"The *Water and Gas Review* for January, 1917, had the following: 'It has been computed over and over again by our best hydraulic engineers, as it is also proven by cities where the best results are shown, that the legitimate consumption of water for all purposes is from 30 to 50 gallons per capita daily, divided nearly as follows: domestic uses, 20 gallons; manufacturing uses, 15 gallons; street sprinkling, 2 gallons; fountain and fire purposes, 3 gallons; to be increased according as the water may be used in a greater or less extent for ornamental and sanitary purposes, 10 gallons. This being the legitimate consumption, the natural inference follows that the excess must be waste. This enormous waste is due to many causes; leaky mains and service pipes; defective plumbing and fixtures; continual flow from private houses, hotels, bar rooms, public buildings, horse troughs, mills, factories and other large establishments; allowing hose to run when not in use, sprinkling lawns, sidewalks and streets beyond reason, the use of automatic sprinklers for ornament and comfort by allowing them to run continually; as also other abuses, many of which are both careless and wilful.'

"Mr. T. C. Phillips, who some years ago was in charge of the water survey division of the Bureau of Engineering, after careful investigations by the use of pitometers and various other means, found that the water actually delivered into the mains in the city of Chicago is distributed as follows: 40 gallons per capita per day for frontage consumers; 47 gallons per day per capita for meter consumers; 10 gallons per capita daily for free service; 5 gallons per capita daily slip thru the meters unregistered; 40 gallons per capita daily lost thru leaky plumbing fixtures. The balance is lost thru wilful wastage and underground leaks."

There has been continual activity by the municipal authorities in Chicago in trying to prevent this great loss. The daily per capita consumption at present is 250 gallons, and this can, without the least harm and with great benefit, be cut to 125 gallons. The stockyards and breweries are such large users that this figure is a very fair one. To pump her water supply, Chicago is consuming about 200,000 tons of coal annually, coal which costs about $4 per ton. If the amount of water pumped were cut just in half, the coal bill might be correspondingly decreased, with a saving in cash of about $400,000 a year. In addition, this amount of coal could be diverted to other uses for the carrying on of the war, or the cars in which this tonnage is carried might be devoted to more necessary uses.

By constant educational measures Philadelphia has been able to reduce her consumption of water from over 200 to about 180 gallons per capita daily in the last four years. At present only 20 per cent of the water is metered, and by continual increase in this percentage the authorities believe that the figures may be brought down to 130 gallons. Dye houses, breweries and steel works are very large consumers in Philadelphia and materially increase the rate over what it would be for the domestic consumption alone. A reduction of from 180 to 130 gallons per capita daily would reduce the coal consumption about 55,000 tons a year, a saving of nearly $250,000 a year cash to the city, to say nothing of the coal saved for our greater present need.

St. Louis, which is 29 per cent metered at present, has a consumption of 130 gallons per capita daily, and it is claimed that if this could be raised to 75 per cent metered, the consumption could be reduced to 100 gallons. St. Louis uses about 3,000 pounds of coal per million gallons of water consumed, for there are two pumpings—from river to settling basins, and from storage basins to consumers. A reduction of 23 per cent in the quantity of water and coal used would mean a great saving in this case, as in the others mentioned.

The three cities mentioned are not the worst offenders by any means—Buffalo has a consumption of 329 gallons per capita daily—but they serve to show what can be done. If the smaller cities will look to themselves, they will find that they can do as much in reducing the consumption of water and thereby save coal. The great source of saving in every case seems to be the installation of meters, so that the householder may know how much water he uses and may realize that he is wasteful, and therefore will start a conservation program in his own house.

Conclusion

Without coal the vast stores of munitions needed for the war cannot be manufactured in most parts of this country. Without coal the railroads cannot transport food, clothing and supplies to our seaports for

shipment overseas. Without coal our great transport fleet cannot carry all these necessities to the men who are fighting our battles in France.

Already the Priority Board of the National Council of Defense has stopped the shipment of road material because the cars are needed even more for the shipping of coal. If the quantity of water used and wasted in each city of this country can be reduced by the coöperation of citizens and city officials, thousands of coal cars will be released for the use of the highway of ficials who are hard hit in their spring plan for road construction by the ban of th Priority Board. If we all use less wate that has to be pumped, we shall aid the hun dreds of factories that are making supplie for the Army and Navy and which to-da are working on a half-time basis, or eve shutting down for a week at a time becaus there is not enough coal at hand to run thei machinery. This is a problem for seriou consideration by all cities.

The Government of the United States expects every city to do its duty by using less water and thereby conserving coal.

Items of Municipal Law

By A. L. H. Street

Duration of Water-Works Franchise

Grant of a franchise to a water-works corporation "for and during the existence of the said corporation" covers an extension of the primary period for which the company was chartered, where the corporation was organized for twenty-five years, "subject to such extension of its term as by law provided," and where the statutes authorized an extension by vote of the stockholders. (United States Supreme Court, City of Owensboro vs. Owensboro Water-Works Company, 37 Supreme Court Reporter, 322.)

Liability Concerning Sidewalks

When an owner of a lot fronting on a street has set his fence back of the true street line, and the abutting space has been treated as being devoted to public travel as regular sidewalk space, the city is under the same duty concerning its safety for public travel as in the case of formally dedicated streets. (South Carolina Supreme Court, Caston vs. City of Rock Hill, 92 Southeastern Reporter, 191.)

Licensing of Meat Dealers

Charter authority given a city to regulate the sale of meat implies authority to impose a license tax upon meat dealers. (Utah Supreme Court, Provo City vs. Provo Meat & Packing Company., 165 Pacific Reporter, 477.)

Changing Street Grades

Where owners of property abutting upo a street have made improvements upo their real estate with reference to an estab lished grade, a change in the grade by th municipality renders the city liable for dam ages to such property, measured by any de preciation in value. (West Virginia Su preme Court of Appeals, Perkins vs. Cit of Princeton, 92 Southeastern Reporte 242.)

Discriminatory License Ordinances

An ordinance imposing a license fee only $12 a year against laundries whe their places of business are situated with the city, but imposing a tax of $120 p year for every wagon used by laundries other cities in transacting business in t particular town is void for unreasonablene in the discrimination. (California Distri Court of Appeal, *ex parte* Hines, 164 Paci Reporter, 339.)

Suits by Taxpayers

Where officers of a municipality ha misappropriated funds and the proper thorities omit to take proper steps to cover the funds, affected taxpayers entitled to maintain proceedings for accounting. (Indiana Appellate Co Michigan City vs. Marwick, 116 Nor eastern Reporter, 434.)

FORWARD STEPS
REPORTED TO THE AMERICAN CITY BY MUNICIPAL OFFICIALS & DEPARTMENT HEADS

CITY ENGINEERS

\greement With Merchants Aids Collection of Waste Paper

CHARLESTON, S. C.—The collection of ıunicipal wastes by the city is one of the èxing problems which has confronted city fficials. Various systems are used, dif-erent types of collection wagons are used, nd all with widely diver-ent results. We attacked ıe waste paper problem ı Charleston with great iligence, as it had been ne of the most trouble-ɔme because of the litter esulting from paper lown or dropped from ıe tops of barrels and oxes used for this and ther rubbish.

About one year ago an greement was made with ıe storekeepers thru the ind offices of the Retail [erchants' Association, hich has resulted in an most complete elimina-on of the litter from aste paper. This paper packed in grain sacks the storekeepers, the cks are securely tied and aced on the curb in the ırly morning. The scrap paper cart, a ɔecially built wagon with latticed sides lown in the accompanying picture, leaves e stable at seven o'clock and collects these cks, leaving in the place of each full sack ı empty one for similar service. The ıper thus collected is disposed of either wasting it on the city dump or by sale junk dealers, who pay a very small sum r it.

MUNICIPAL WASTE PAPER COLLECTION WAGON, CHARLESTON, S. C.

The Retail Merchants' Association has been of special service in urging its members to keep to the routine outlined above and to conform to the hours and methods specified. It is gratifying to note the co-operation of the merchants in thus aiding the city in the performance of its duties.

Coöperation in this manner between municipal officials and merchants saves time, money and agitation for both the private and the public corporation.

J. H. DINGLE,
City Engineer.

FIRE DEPARTMENTS

Better and Safer Fire-Fighting With New Nozzle

PORTLAND, ORE.—One of the members of the Portland Fire Department, Lieut. Clyde

F. Hughes, has recently invented a protective nozzle for fire hose which has proved so effective that it has been adopted for Engine 12. Many large open fires prove so uncomfortably hot to the men that it is impossible to approach within effective fighting distance. To overcome this handicap, Lieut. Hughes perfected a nozzle which provides a "barrage" or curtain of water between the man operating the hose and the fire itself.

This new nozzle, illustrated in its diversified uses below, is capable of discharging thru one outlet a spray the angle of which may be varied by a slight twist of the wrist while it is in use, without the necessity of changing attachments or the closing or opening of a valve. The range of variation includes all angles between a straight forward spray and a transverse water curtain. The ordinary solid stream may be discharged from this nozzle in as efficient a form as in the plain straight-stream nozzles. While the solid-stream pipe and the spray outlet are independent of each other, they may be used in combination when desired.

The construction is simple and durable, and designed so as to conserve velocity and pressure.

While this nozzle may be made for use with any size hose, it is better to use it on 1½-inch hose, as this size is much more readily handled than the larger hose. The 1½-inch hose has been in use for over ten years in Portland with great success. The use and manipulation of the smaller hose is well treated in a discussion, quoted in part below, submitted by Lieut. A. W. Wefel, and which won first prize in the Portland Fire Bureau school:

"For inside fires in dwellings, attics and basements and for roof fires, its direct benefit demonstrates itself on account of being easy to handle; it does less water damage, can be changed with much more ease from one room to another, and can be handled like a chemical line by one man. When in a narrow passage or hallway, a turn can be made with line much easier and quicker. The very fact that it reduces damage by water in dwellings or other establishments proves its usefulness in this work of fire-fighting. For wetting down it is the proper kind of line to use, as the men are tired and with the use of it one man handles the line while others are kept busy turning over articles. A stream from a 1½-inch line is effective and surprising, as it brings good results. Can be taken to a roof much quicker and is not so bunglesome, for it can be handled by one man, as it is so much lighter than a 2½-inch line. May be used to lengthen out line when 1,000 feet of 2½-inch hose would not reach fire. Does not use up much space on apparatus. I have experienced that with the use of 1½-inch hose it is a fact that you can get closer to the fire, which is the thing that counts, as it is not so much the amount of water that goes on the fire as the stream that strikes the base of it that counts. Men who wear a smoke helmet into a fire will find a 1½-inch line the best kind of a line to take with them. When changing position, two men may readily do this when ordinarily four men would be required to change position with a 2½-inch line. During meal hours, when company is short-handed, small line comes handy, as two men can handle it and drag it to where they need it. As soon as a big fire is under control, by adding a length of 1½-inch hose men may enter buildings more readily and do effective and efficient work. Outlying companies may find hydrant pressure inadequate to give proper kind of stream when using 2½-inch line, where by using 1½-inch hose the stream is more efficient and better work may be done. In case of emergency, an Ashworth tip can be used as nozzle on 1½-inch hose. If at any time it is necessary, small line may be removed from large nozzle, this giving a greater amount of water. The very fact that it has not been disposed of after a period of over ten years' service in the Portland Fire Department proves that it is a necessary article in the work of fire-fighting in this department. It is well to mention that small hose is handled with a shut-off nozzle, giving the same advantage as that of a nozzle used on a 2½-inch line. If two lines are being played on a fire and there is no other large nozzle available, a third line may be put into service by the use of small hose by using a reducer from 2½-inch to 1½-inch, carried on apparatus. It may be used direct from a stand-pipe with the use of a reducer. It will stand big pressure. The reason Portland firemen like to use a small line is that by experience they know they can do good work with it."

The methods of fighting various types of fires, while not altered in any great measure, are made safer for the fireman by the use of the protective nozzle. If, on arriving at a fire, the firemen find flames or smoke bursting from the windows so that it is impossible to distribute a stream over the interior of the building, the new nozzle may be brought into play, and by spreading the spray to the required size to cover the window, the smoke and flames may be forced back sufficiently to permit more effective operation; or, if the fire be confined to a small room, the angle of the spray may be varied from one extreme to the other. In this way much heat and smoke is consumed and the entire interior of the room is hit with a light spray. This action is very desirable for fighting attic fires and in some cases basement fires.

It is actually possible to "shovel smoke" with this type of nozzle. A room may be entered from inside the building, a large conical water curtain formed, and the smoke and flame driven before it and practically shoveled out of the window, leaving only a few finishing touches to complete the job.

In case a pan or a barrel of oil is burning, a solid stream would only serve to spread the flames, but by using the spray the fire may be covered with a curtain of water, the angle of which may be varied so as to close in upon the fire from all sides confining the smoke and forcing it back

VARIOUS PHASES IN THE OPERATION OF THE NEW PORTLAND, ORE., FIRE NOZZLE

into the fire until the flames die for want of air. When working with 65 pounds hydrant pressure and 50 feet of 1½-inch hose, the new nozzle will discharge a water curtain 50 feet in diameter.

If, at a large open fire, it is necessary to work in a very hot place, this nozzle is attached to a 1½-inch line of hose; in this way one man can handle it, and by discharging the water curtain between the men and the fire they can get close to their work. In case the heat should become too great, or the draught should carry it behind the curtain, the nozzle may be held above the head in an upright position; it thus serves as an umbrella of water, and by crouching low to the ground the fireman can withstand much heat. The small hose is appreciated if it becomes necessary to move about under the foregoing conditions.

If, during the progress of a fire, an adjoining building should be in danger, a water curtain could be discharged from its windows. When discharging a transverse water curtain, there is no back pressure against the hose. This makes it easily handled, and it may even be left lying in the street wide open, without danger of its whipping about.

A fireman equipped with the new nozzle is prepared to fight the fire from start to finish with any kind of stream he needs as various conditions arise. Much water damage is avoided and the fire is quickly extinguished.

B. F. DOWELL,
Chief Engineer.

CITY FORESTERS

A Year of Development in Park Maintenance

New Rochelle, N. Y.—In order to maintain the high level of attractiveness set many years ago for New Rochelle, it has been necessary to continually plan and look far ahead in the matter of the administration of the parks and other public rest places. In these days it has become practically obligatory on the part of the authorities to place as many of the attractions as

ARTISTIC GROUPING OF SHRUBBERY ALONG RESIDENTIAL STREET, NEW ROCHELLE

A BEAUTY SPOT ON MAYFLOWER AVENUE, NEW ROCHELLE, N. Y.

possible, such as the bath-houses, on a paying basis. By this means, money has been released for the needs of the other attractions which could not be self-supporting.

The three illustrations shown in this article are examples of what has been accomplished in the matter of grouping shrubbery along the public highways, and the uniform setback of houses to give restful vistas of green lawn in front. Constant supervision of these places is necessary on the part of the public authorities in order that there may be no development of pests which will gain ground on private lands to the later detriment of the public parks. In addition to the watchfulness of the Department over private grounds, a great deal of work has been done in protecting the good old trees in the parks by cleaning out the cavities. This work is done very thoroly: the trees are first scraped and then treated with an antiseptic solution and sealed against water and agents of decay by a waterproofing preparation. The cavities will remain open for at least one season before the final filling is made. In this way we can make sure that no further decay exists. It often happens that when a cavity is cleaned out, treated and filled at the same time, additional decay takes place, causing an excretion of fermented sap, which helps loosen and crack the cement filling, causing it to fall out in sections.

In maintaining the lawns in our parks, chemical fertilizers with a proper proportion of blood and bone have been used. This gives the most satisfactory results and eliminates any possibility of existing weed seeds, which are unavoidable when stable manures are applied to grass-growing areas.

At the entrance of Hudson Park a large oak tree had died from modern highway improvement. Its age was about two hundred years. In its position it had become a recognized feature of landscape effects, and, rather than take the entire tree down, we made good use of it. The long, dead limbs were partly cut off, leaving stumps of from 4 to 10 feet attached to the large trunk of the tree. The diameter of these stumps ranged from 15 to 24 inches. The ends were bored out to a depth of 18 inches, and

plants and vines were planted in these openings, with the result that the tree now presents a very distinctive feature with its almost complete cloak of vines.

During last summer we featured a large floral American flag in Hudson Park. The flag measured 14 by 30 feet and was composed entirely of plants. Many visitors came from considerable distances to see the growing flag.

One of the necessary features of a shade tree department or a department of forestry in any city is a municipal nursery. As yet we have none in New Rochelle, but we are looking forward to acquiring one within a year or two. It is a measure of economy once it is started, for it will save many thousands of dollars each year in the purchase of transplants.

A material change in the method of operation of our municipal bath-house in Hudson Park has resulted in a far better feeling on the part of the residents. In former years no preference was shown to New Rochelle residents in admittance to the bath-house. To remedy this, bathing coupon books were issued to residents upon application, and an increased charge was made to non-residents. This reduced the number of bathers by about 18,000.

The bathing coupon book system is operated as follows: The books contain 68 coupons and are issued to New Rochelle residents only, who make application in person at our office. Upon presentation of the book at the public bath-house a coupon is taken out for each person, and an admission charge of 10 cents on week days and 25 cents on Sundays and holidays is collected. Non-residents, also those not in possession of the bathing book, are charged the regular rates: week days, 25 cents; Sundays and holidays, 40 cents. The coupon books can be used by any member of the family or by a guest of the resident to whom the book is issued. When all the 68 coupons have been used, another book can be obtained at our office by returning the cover of the original book.

THE LAWN AND ATTRACTIVE ARBORICULTURE IN ONE OF NEW ROCHELLE'S PARKS

THOMAS J. WADE,
City Forester, Secretary of the Park Department.

EDUCATION - DEPARTMENTS

A Practical Demonstration in Refilling Fire Extinguishers

PUEBLO, COLO.—Modern education is based on observation as well as text-book instruction. This has been applied in the physical and chemical laboratories of our high schools, where to-day the students manipulate the apparatus and perform the chemical experiments themselves. We have carried this idea to its logical and practical conclusion and thereby have added a lesson in fire protection for our students.

Every school building in the district has hand fire extinguishers charged with chemicals placed convenient for use. Each year the chemicals in all these extinguishers should be renewed to keep them at the maximum of effectiveness. In order to maintain this effectiveness, the class in high school chemistry annually collects the extinguishers and refills them with the proper chemicals. The process of renewing them has become an event of some importance in the school life; bonfires are built and then put out by the extinguishers. Thus the old charge is removed, and at the same time the present generation is instructed in the proper use of one of the best means of fire protection. The extinguishers are then cleaned and recharged by the pupils themselves before being placed in their proper locations ready for the time when they may be needed to protect the lives of the students.

The value of this annual event reaches far beyond the simple instruction in chemistry. First, it is impressed on the mind that the annual renewal of the contents of the containers is a necessity; second, the internal mechanism of the apparatus is learned once and for all; third, the best method of operating the extinguisher is demonstrated at the time the extinguishers are emptied; and, last, by actually handling the cylinders the children overcome any slight dread of them which they may feel.

This method of keeping the extinguishers in any school building at the maximum of effectiveness is well worth the serious consideration of all high school principals and municipal officials.

C. K. FLETCHER,
Principal, Centennial High School.

NEW LIGHT STANDARDS, YORK, PA.

PUBLIC SAFETY - DEPARTMENTS

From Dimness to Brightness

YORK, PA.—Feeling the need of better lighting for the business district of the city, the government of York, Pa., set out a little more than a year ago to correct the faulty lighting then in use. As soon as the business district was considered, there was a desire to improve conditions over the entire city, so that before the work was completed many sections of the residential district were greatly improved.

Eight blocks of the business district were first dealt with. Steel poles, placed approximately 100 feet apart, support the new lamps and in addition carry the trolley wires, thus doing away with another set of wooden poles along the streets. The latest

type of nitrogen-filled incandescent lights is used, operating on a 6.6 ampere circuit at 750 volts and giving about 400 candle-power per lamp. Special canopies are employed over the lamps to protect them, and Holophane refractors spread the light very effectively. In order to use a small fixture, the transformer for stepping up the current from 6.6 amperes to 15 amperes is housed in the small ball at the top of the fixture illustrated.

About seventy-eight of the lamps burn until midnight and are fed from ten series circuits of a maximum voltage of 750 volts, as mentioned above. This voltage is maintained on the circuits because it is the pressure used on the trolley wires which are supported on the same poles.

In other parts of the city 475 old style 6.6 ampere direct-current lamps were replaced with the new style lamps in a slightly different fixture, which contains the compensator required to change the current from 6.6 amperes to 15 amperes.

The station equipment for the street lighting system consists of eight Westinghouse 30-kilowatt constant-current transformers with the necessary switchboard equipment.

DR. J. H. BENNETT,
Director of Public Safety.

HEALTH DEPARTMENTS

School Children—Public Health Delegates

Chicago, Ill.—The Bulletin of the Chicago Health Department carries the legend, "Sanitary Instruction is even more important than Sanitary Legislation." This is because the Department keenly appreciates the necessity of intelligent coöperation on the part of the public in a program which aims to utilize the teachings of modern medicine to the fullest extent for the prevention of sickness and prolongation of life.

There is a unanimity of opinion among public health officials in regard to the necessity for educating the public in all matters relating to the conservation of health, but varying degrees of success have been obtained in the teaching methods that have been employed for imparting this knowledge. In many instances the information has reached only those who are least in need of such instruction, while the foreign population and the economically dependent classes have been reached ineffectively, if at all. In fact, it has been found that in order to properly reach these classes, in cases where the needs were imperative, it was necessary to send nurses and social workers into their midst. These health officers and social workers have always been struck by the readiness with which the school-going members of such families accept teaching regarding proper living and the enthusiasm which they show in carrying out any suggestions made.

Chicago has also had her clubs, and they have been enthusiastically attended by large numbers of girls from the higher grades of grammar schools each year. But this instruction covered only one phase of public health work, and the many new problems added to this work by the entrance of the United States into war and the drain on forces engaged in health work by the withdrawal of nurses and physicians for government war service made it imperative, in the opinion of the Chicago Commissioner of Health, that the great mass of people should be reached and instructed in order to keep up proper health conditions.

Accordingly, in June, 1917, a meeting was called at the LaSalle Hotel, of all employes of the Department of Health, the Municipal Tuberculosis Sanitarium, and representatives of civic bodies, at which meeting an organization was effected of the Chicago Public Health Association, Dr. Arthur I. Kendall, Dean of Northwestern University Medical School, being elected president. The idea was that this central organization should become a nucleus for various branches to be organized thruout the city.

The city of Chicago is divided into seventeen districts by the Department of Health, each of these districts being in charge of a supervising health officer. These supervising health officers were then placed in charge of the organization of branches in their respective districts, a definite plan having been outlined for such organization the supervising health officer being the chairman of the meeting in his district.

A well-written paper on a health topic was prepared by the Department of Health

to be read at each of the seventeen meetings, and arrangements were made thru the local chairman for an additional paper to be presented by some person in the district.

Announcements of these meetings were carried in the street cars and in the press, and notices read from pulpits of churches. Posters were distributed to stores for window display in the neighborhood of the seventeen school houses in which meetings were to be held. But in spite of the apparently well-thought-out plan of organization and the extensive publicity, the attendance at the July and August meetings was not large.

The Commissioner of Health then conceived the plan of having each room of the sixth, seventh and eighth grades of the public schools elect three delegates each to represent the room for three months at the public health meetings. The Superintendent of Schools, the principals and teachers, entered into the plan and gave every assistance to the children in electing their delegates. The pupils were instructed to take notes on the papers read and to report to their classes in written form. They were told they might have the privilege of bringing their parents with them to the meetings.

The children enthusiastically entered into the plan, and the September meetings were attended by a total of ten thousand persons. The children were eager to take notes on the papers read and were anxious to be accurate in their reports to their rooms.

For the month of October the plan put into operation in the grammar grades was extended to the high schools. The attendance for this month mounted to twelve thousand.

It is felt by those in charge of these meetings that the plan outlined above has accomplished or will accomplish four things:

1. It has aroused the interest of a large number of children and young people in public health matters thru the element of competition injected into the election of delegates.

2. Extending to the delegates the privilege of bringing their parents to the meetings has resulted in getting to them a large number of people who would otherwise not have been reached by any method of publicity heretofore devised.

3. Reaching the children at a very teachable age is certain to have an effect on morbidity statistics of the future.

4. Reaching the parents of children who would otherwise not be reached should have as an immediate effect the lowering of our morbidity and mortality statistics on contagious and preventable diseases.

JOHN DILL ROBERTSON, M. D.,
Commissioner of Health.

POLICE DEPARTMENTS

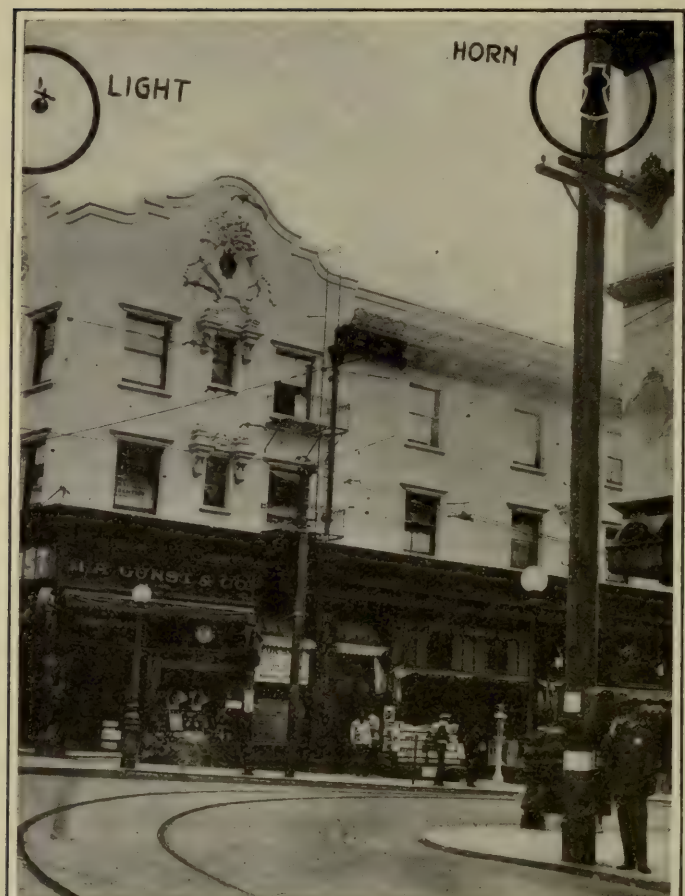
Speed in Police Work

BERKELEY, CAL.—The city of Berkeley, Cal., has been among the foremost to recognize that in these days of swift transportation one must set an automobile to catch an automobile, and some time ago all the patrolmen of the police department were equipped with Fords. The city pays each officer thus mounted $27.50 a month for the use of his machine, and in addition supplies the necessary oil and gasoline—which solves the financial problem for city and men alike.

Essentially a residence town, Berkeley covers a large area, and the chief of police, August Vollmer, says that were it not for the use of automobiles the force at present employed would be entirely inadequate, for the auto-mounted man covers about four times the distance which could be covered by a foot-patrolman. This speaks volumes for the economy of the plan, while as for efficiency, under the new system crime of a serious nature has been practically eliminated from the city.

The progressive methods adopted by the police department have met with the approval of the townspeople. The women of the city, particularly those who live in the more lonely districts, frequently express their feeling of safety since the automobiles have come into use. They know that within a very few minutes after telephoning to the station a policeman will be at their door, and that if their call for assistance be prompt the apprehension of the offender is also likely to be prompt.

A number of years ago a Gamewell signal and alarm device was installed in the Berkeley police station, and switchboard and automobiles work naturally together in police service, neither being capable of get-



THE "LIGHT" AND "HORN" ARE GREAT AIDS TO THE POLICE IN BERKELEY, CAL.

ting the best results without the other. Many things are gained by the combination, but chief among them is speed—that all-important factor in police work.

In connection with the switchboard, signal lights and alarm boxes are placed at equidistant points thruout the city. Horns also have been installed for day service and are used as well, in case of extreme emergency, by night.

From the alarm boxes on the street each patrolman reports to the central station once an hour. He calls his name and the number of the box, the location from which he calls being confirmed by a telegraphic tape which runs simultaneously with the indicator alarm box. The tape registers the number of the box and the hour and minute of the call, and the system keeps officers and sergeant in close touch.

Whenever a policeman is needed between calls, the desk officer presses an electric button, and on the street a red light flashes, so many times for the man in one district, so many times for one in another. In case of murder or other great crime, all the police lights of the city are turned on in a steady blaze, and in less than half a minute the men begin to call in—as swiftly in fact, as they can motor to the nearest boxes and unlock them. This means of quick communication coupled with the automobile service, makes it possible for the full force to be at work in an incredibly short space of time.

The first man to report may be sent speeding after the automobile in which the criminal is making his escape; the next may be assigned to cover the nearest street car to which the fleeing man might transfer himself; others are sent to the scene of the crime itself. Even the inspectors use automobiles, and finger print men are on the scene while the finger-prints are fresh. Often the victim of the crime has his life saved by means of the first-aid outfit which every officer carries in his machine, and, if the injury be not too severe, the sufferer is taken direct to the hospital without having to wait for an ambulance.

In the central station an ordinary switchboard is set at right angles to a Gamewell board, and whenever quick service is especially indicated, the operator can reach over, press an electric button, and, while he is receiving the description of a criminal over one telephone, he can be repeating it over the other to the officer in whose district the crime is being committed. It has even happened that an arrest has been made before the complaining citizen could get from his telephone in the back of the house to the front door, and when he

reach the front door he was met by an officer escorting the offender up the steps in order that he might be identified!

Recently a woman telephoned that she had heard a shot and had seen a man, whose description she gave, running away from the vicinity. A man from the station, a finger-print expert, ran out, jumped into his car, and went speeding towards the junction nearest the scene of the crime. He arrested a man answering in a general way to the description given, who was running for a car which would have taken him to another city.

The fellow was turned over to a patrolman, and the arresting officer went to the scene of the crime, where he found the body of the victim, who had been murdered. He also found a dagger, dropped in the haste of flight by the murderer, whose first intention had evidently been to use it instead of the gun. Before anyone else had an opportunity to touch the dagger, the finger-print man was able to develop the latent prints upon it; at the station the finger-prints of the arrested man were taken—and they tallied with the impression on the knife.

In ordinary cases that knife might have been handled by a dozen persons before an officer got his hands on it, and all positive evidence as to the criminal's identity would have been obliterated. Without this evidence the man undoubtedly would have escaped justice, for, as it happened, there was nothing else of an equivocal nature to connect him with the crime.

This is but one of many instances that could be given of the speed and accuracy with which police work may be done when a department is equipped with the modern means of accomplishing its most difficult task.

BARBARA PEARSON,
Secretary to Chief of Police.

PUBLIC WELFARE - AND SERVICE -

Liberty Bonds for Sinking Funds

BOSTON, MASS.—One of the best examples any city can set for its citizens at this time is the investment of its funds in Liberty Bonds. As was stated so many times in the days during the floating of the first two issues, Liberty Bonds are the very safest investment anyone can make. This statement may well be extended to include cities as well as individuals.

The city of Boston, thru its Sinking Fund Commissioners, subscribed to $500,000 of 3½ per cent Liberty Bonds and $1,000,000 of the 4 per cent issue, altho, of course, the allotment was somewhat less. The sinking funds of the city have heretofore been solely invested in City of Boston and Commonwealth of Massachusetts bonds. Altho the Commissioners are at liberty to buy many bond issues which are a legal investment for Massachusetts savings banks, they have always been governed by an unwritten rule that their investments should be confined to the two classes of securities mentioned above.

It is to be hoped that trustees of similar public funds will invest them in future issues of United States Government bonds, not only thru patriotic motives, but also because they are protecting the citizens of the community by making a perfectly safe investment; those who are unable to purchase bonds of the smallest size may then feel that some of their money, as represented by the municipal funds, is invested in the cause of justice.

LOGAN L. McLEAN,
Chairman, Sinking Fund Commission.

The Mosquito Control Work of a County

ATLANTIC CITY, N. J.—No community can long remain as popular as Atlantic City and have an abundance of mosquito pests in evidence. Atlantic City had mosquitoes by the hundred thousands a few years ago, but the constant and well-directed work of the Atlantic County Mosquito Extermination Commission has made mosquitoes rather uncommon as a source of discomfort in the city.

While some sections of the county were pretty well filled with mosquitoes from the salt marshes this last summer, Atlantic City itself was practically free from them. The early season was very favorable to mosquito breeding, but their presence in the more settled portions was checked in season to prevent discomfort. In the fresh-water work the records of the Commission show that there was a decrease of 8 per cent of the probable number of breeding

A BAD MOSQUITO BREEDING HOLE, MISSOURI AVENUE AND READING RAILROAD, ATLANTIC CITY, N. J., BEFORE FILLING

THE SAME "HOLE" AFTER DRAINING AND FILLING

places and a decrease of 48 per cent in the actual number of breeding places found.

The two illustrations with this article show the "before" and "after" appearance of a tract of land that has been treated by the Commission. Stagnant water is necessary for breeding of mosquitoes; oiling the tracts where pools occur will check the growth of most of the larvæ, but draining, tho sometimes expensive, is the most effective and the surest method of eliminating the breeding places. The pictures show the meadow at the lower end of the residential section of Atlantic City before and after draining.

FRED A. REILEY,
Chief Inspector, Atlantic County Mosquito Extermination Committee.

THE TENNIS COURTS IN BILLWOODS PARK, TORONTO

PARK DEPARTMENTS

War Time Development in Toronto Parks

TORONTO, CANADA.—Park development in Toronto has been considerably curtailed during the last three years on account of war conditions; nevertheless, working on the principle that every dollar expended in upkeep should be made to produce a definite measure of permanent improvement, we have succeeded, even with considerably lessened appropriations, in furthering our development plans in many of our park areas.

The reclamation of marsh lands upon Toronto Island, undertaken during the year as part of the harbor improvement scheme, has added somewhat over fifty acres to our park area.

The reclamation of fifteen acres of swamp lands in High Park, involving an outlay of approximately $60,000, which is being accomplished by the rail transport of sand from the shores of Lake Ontario over a distance of 1¼ miles, will, when completed, furnish a recreation area of twelve acres with a water treatment of three acres, resulting in the abatement of the prevailing mosquito nuisance in this district and the creation of a beauty spot of great scenic value.

The practical completion of the Humber Boulevard section (3½ miles) of the Main Boulevard of 32.67 miles designed to encircle the city, was the most important work undertaken during the past year. The outlay upon this section has involved an expenditure to date of approximately $120,000, and furnishes a connecting link between the great Harbor Development plan

and the improved Dundas Street Highway. The Boulevard has been very largely used by the motoring public; as many as 762 automobiles have passed a given point upon it in one hour.

A step towards the completion of quarters for the animals and birds at the Zoo was taken in the erection of a cage for carnivorous birds, 180 by 56 by 25 feet, constructed of steel framework covered with heavy wire mesh, and the commencement of an addition of 2.4 acres to the wild fowl pond.

The forward movement of our playground work has been most marked in recent years. In 1910 but one supervised playground was in operation in Toronto, and in that year the total outlay on account of upkeep amounted to $1,143. We are now operating eleven equipped and supervised playgrounds, with a total annual outlay for maintenance of $40,000, and employing forty-nine male and forty-three female supervisors, including both permanent and temporary help.

Our forestry work is well illustrated in the following table:

Number of trees sprayed and cleaned	98,319
Number of trees pruned	16,159
Number of trees removed	1,542
Number of trees planted	3,411
Number of trees transplanted	52
Number of young trees cared for	23,482
Number of trees given surgical treatment	9,306
Total number of trees attended to during 1915	152,271

Following is a table showing the general facts of the park system of Toronto:

Number of parks and playgrounds, 57.
Area of parks (land), 1,461.87 acres.
Area of parks (water), 407.34 acres.
Area of city, 32 square miles.
Population of city, 460,526.
Number of persons to each park acre, 315.
Annual total cost of all services per capita, $0.81.
Annual maintenance cost per park acre, $108.
Total cost of park lands, $2,395,122.
Value of park lands, $13,942,857.
Value of buildings under jurisdiction of Department, $2,609,900.
Area devoted to playgrounds, 14.25 acres.
Area devoted to athletic fields, 117.8 acres.
Expenditure on Maintenance Account, 1917, $359,411.
Expenditure on Permanent Improvement Account, 1917, $106.615.

C. E. CHAMBERS,
Commissioner of Parks.

Municipal Bath-House in Business District

Kansas City, Mo.—Among the few cities that realize the great benefits of a well-operated municipal bath-house in the business district is Kansas City. The city has erected an attractive building for this purpose at Eighteenth and Holmes Streets, in the north end of the playground known as Holmes Square. The location is very con-

MUNICIPAL BATH-HOUSE FOR BUSINESS PEOPLE, LOCATED IN HOLMES PARK, KANSAS CITY, MO.

HAS YOUR CITY A MUNICIPAL SKATING RINK?
As many as 20,000 have been accommodated at one time on this pond in Lincoln Park, Chicago

venient to the business district, and consequently is frequented by the people of the business houses.

The building is approximately 60 feet by 65 feet, outside dimensions, and is built of native limestone, with a tile roof. The architecture is very attractive and worthy of its location, as will be seen by the accompanying illustration. The first cost of the building was about $12,000, and the annual net cost of operation is $2,752.42. The south portion of the building is two stories in height and contains most of the rooms of the structure. The first floor contains two waiting-rooms, attendants' room, eight individual showers, and one shower room with ten showers, for men; five individual showers, one shower room with eight showers and one tub, for women. One comfort station is provided at each side of the building.

The second floor has a gymnasium and play room and two club rooms. A nominal charge of one cent for a towel and one cent for soap is made if the patrons do not bring their own, while if they do, no charge is made. The building is open twenty-four hours a day every day in the year and boasts of a yearly patronage of 31,000, composed about equally of men and women.

The maintenance of a public bath-house in an attractive location so near the business district is well worth the careful consideration of the many cities which do not provide that luxury.

RALPH R. BENEDICT,
Assistant Superintendent of Parks.

Skating the Best Winter Sport

CHICAGO, ILL.—In those cities situated in the northern part of the United States and in Canada, Nature provides one of the most enjoyable and beneficial outdoor sports when the ponds are frozen. Skating far surpasses coasting in every way; one can skate as long as he wants to at a time, and the exercise in the open air strengthens the lungs and builds up the body against the ever-present danger of overheated houses and apartments. Chicago has provided ample opportunity for skating on her many ponds; among them probably the greatest is the lake in Lincoln Park.

This 10-acre expanse of water has provided skating facilities for as many as 20,000 people at one time, and as long as it is cold enough for the ice to be safe it is maintained in good condition by daily scraping under the supervision of the park authorities. A refectory was built prior to 1903 to supply soft drinks and lunches to the skaters, but this was soon outgrown and it became necessary to construct another and larger building, which is in use to-day on the South Pond. A large, well-heated rest room is provided, and skates are rented to individuals if they so desire.

JOHN C. CANNON,
Secretary, The Commissioners of Lincoln Park.

CITY CLERKS

A Step to Improve Municipal Reports

Columbus, Ohio.—Municipal reports are, in many cities, so delayed in preparation and tardy in publication that they are more or less out of date when issued. Last year Columbus was remarkably early in the publication of her annual report, and it has been the ambition of the City Clerk to have it issued even earlier this year. It is our desire to succeed, not only in point of time, but also in general makeup and uniformity of expression. To this end we have issued the instructions to heads of departments and divisions, presented below:

To Department or Division Heads:

By provisions of Ordinance No. 29,760, passed December 11, 1916, annual reports for the preceding year must be filed in duplicate with the City Clerk not later than the last Monday in January. . . .

To assist in preparation of these reports, details that will operate for uniformity are herewith suggested. Of chief importance is condensation. Do not put anything in your report that has no bearing on the operation of your department. Each extra word means an unnecessary printing expenditure. Failure to follow this suggestion will necessitate editing your copy in this office before the report is sent to the printer.

There is a popular demand among Columbus taxpayers for "greater service for less money." If your department has to its credit accomplishments of this character, set down such facts in your report. Do not burden your 1917 report with information or details that were carried in your 1916 report. Include only information covering 1917 activities.

For your information, these suggestions are made:

1. Use legal size paper only—that is, 8½ by 14 inches. All reports must be typewritten and double-spaced. Under no consideration should single-spacing be employed.

2. Never make use of the first person pronoun in writing a report. Examples: (incorrect) "I recommend that extensions be of the new type." Employ this style: "This department (or 'the superintendent') recommends that extensions be of the new type."

3. Do not say: "This department," when the correct form is "this division." Follow the charter.

4. In capitalization, avoid "upper case letters" except in referring to proper names. Do not use this form: "This Department proposes that the Market Houses be placed under supervision of the Street Cleaning Division." Rather, follow: "This department proposes that the market houses be placed under supervision of the street cleaning division." Above all, avoid long and involved sentences.

5. Wherever reference is made to figures in a report, except in tabulations, use numerals for figures above ten, and write out, in full figures below ten. Examples: (incorrect) "During the year 9 horses consumed one hundred tons of hay"; (correct) "During the year nine horses consumed 100 tons of hay." Other exceptions to this rule: Reference to sums of money should be in figures; also dates.

6. Eliminate tabular matter, so far as possible. As a general rule, the public cares nothing about a great volume of unintelligible figures. It is preferable that a narrative form, based on figures, be submitted. There is no necessity of including in your report a financial statement for the year's business. The auditor's report will carry this. There are cases, of course, where figures and tables are of more value than "straight matter." For example: The tables "Fire Losses" and "Insurance, 1916," in the 1916 report of the Columbus fire department, page 115 of the bound reports in your possession, could not be set forth in any other satisfactory form.

7. In the bound volume of 1916 reports there are several splendid examples of form for guidance in preparation of your report for 1917. The form followed in the civil service report, page 162, should be followed as regards subdivisions. So far as practicable, follow such style in explaining the operations and accomplishments of your department. Other good examples are: report of division of fire, page 114; report of division of police, page 118; report of division of garbage and refuse collection, 46.

8. The rule set down in Ordinance No. 29,760, governing the date of filing reports must be followed rigidly. This means that all departmental and divisional reports must be filed with the City Clerk on or before January 28, 1918.

C. E. DITTMER,
In Charge, Bureau of Information and Publicity, Office of City Clerk.

The Municipal Electric Lighting System of Eugene, Oregon*

By C. W. Geller

General Superintendent-Secretary, Eugene Water Board

THE building up of a business from nothing to the complete control of the electrical field, in the face of the most strenuous opposition from the time the first shovel of earth was turned at the power plant until the last wire was strung in the city, is something that any city may well be proud of.

The McKenzie River, which supplies power for the Eugene municipal hydroelectric plant, has its origin in Clear Lake, a snow-fed body of water situated in the Cascade range, about 70 miles east of Eugene. At its upper end the stream is deep and swift. It gradually becomes broader and more shallow, however, and for the final 30 miles it runs thru a low farming country until it joins the Willamette at Coburg.

The intake for the city power canal is located on the north bank of the river, 18 miles east of Eugene. From the intake, water is conducted to the plant thru 19,400 foot of canal and 650 of wood flume. The water available is more than sufficient to run the plant at its maximum capacity every day in the year, the minimum flow of the river being approximately 1,500 second-feet.

The power plant is located 2 miles west of Waterville, 14 miles east of Eugene, and 1 mile north of the McKenzie River. It contains two units, having a joint normal rating of 1,880 horse-power. Only half of this output is available at Eugene, however, until another bank of three step-up transformers is added to the station equipment. Energy at 23,000 volts is transmitted over 15.5 miles of single line to the city's substation at Eighth Street and the Southern Pacific Railway.

Approximately 80 acres comprised the total city property holdings for the plant and canal purposes until March, 1912, at

POWER CANAL OF EUGENE HYDROELECTRIC PLANT
The canal grade is 2.11 feet per mile and the embankment slope is 1½ to 1

* Copyright, 1917, Oregon Society of Engineers. Reprinted by permission.

ELECTRIC OPERATING REVENUE—COMMERCIAL LIGHT AND POWER

	1912	1913	1914	1915	1916
January	$1,326.92	$3,951.28	$5,211.51	$5,189.53	$5,274.18
February	1,562.25	3,691.39	4,912.22	4,819.96	5,176.36
March	1,772.68	3,613.46	4,272.18	4,194.01	7,402.41
April	2,259.97	3,750.68	4,155.17	4,204.96	6,141.32
May	2,727.86	3,175.34	4,071.76	4,101.23	6,537.52
June	2,983.40	3,372.02	3,960.28	3,897.22	6,369.65
July	3,159.02	3,382.11	3,718.57	3,883.46	6,231.44
August	3,539.14	3,744.40	3,698.49	3,822.31	6,191.37
September	3,410.79	4,028.84	3,890.18	4,086.79	7,181.33
October	4,445.93	4,665.82	4,311.85	4,631.71	7,906.48
November	3,451.48	5,107.03	4,712.71	5,165.68	8,965.22
December	3,664.91	5,056.79	4,900.93	5,369.63	8,868.04

which time an additional acre was purchased as a building site for two five-room bungalows.

Equipment is now on hand and in process of installation for a complete set of step-up transformers. With the completion of these, the plant will be fully equipped in this respect.

Waterville is now being served with electric service from the plant direct by means of a pole line up the canal. This pole line also carries an emergency telephone line which in case of special need can be connected thru to Eugene over the Government Forest Service telephone line. Switching equipment for this purpose is installed in the Waterville store.

Commercial activity began December 1, 1911, and as block after block of wires were strung customers were added.

This healthy growth continued until the spring of 1915, when a careful check indicated that 66 per cent of the total available electrical business has been secured.

The Board then considered the advisability of installing a standby or emergency plant to protect its service. Extensive studies and investigations were conducted. One of the organization, while on a trip in the eastern states in the fall of 1915, devoted considerable time to this subject there, and when everything was in readiness to act, a final effort was made to open up negotiations with the competing company for the purchase of its electrical distribution system.

Practically an ultimatum was delivered to the corporation, to the effect that this would be its last opportunity to dispose of its holdings in the city; that if a purchase could not be agreed upon and a contract entered into for emergency service, the city would construct its own electrical auxiliary.

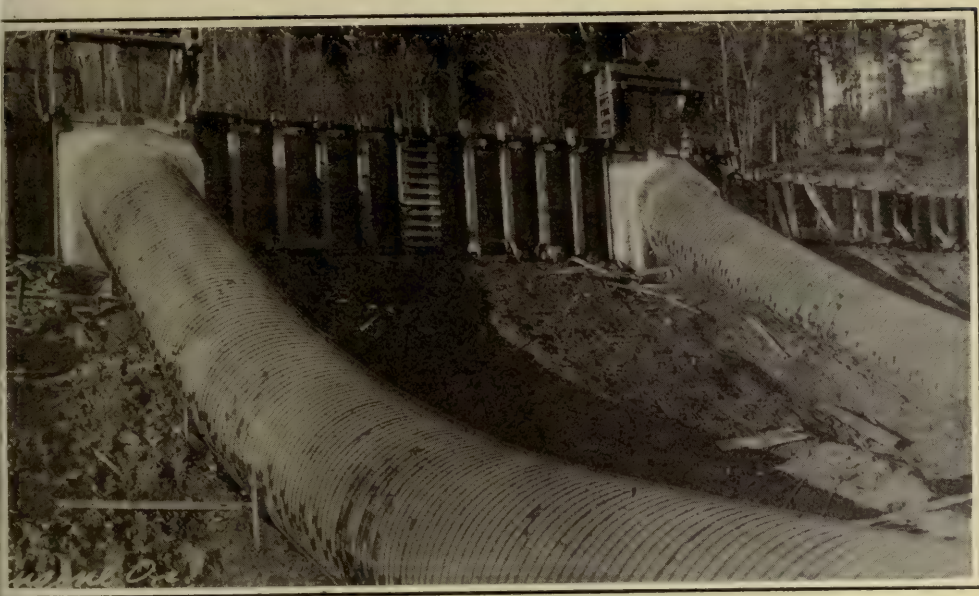
Conferences and sessions were then held, and about nine months later final purchase contract was signed for the purchase by the city of the corporation's electrical distributing system in the city. Likewise a contract was entered into wherein the corporation agreed to furnish the city with emergency or standby service, at a rate cheaper than the city could maintain its own auxiliary service. The total purchase was

ELECTRIC OPERATING REVENUE—MUNICIPAL PUMPING PLANT

	1913	1914	1915	1916
January	$631.75	$777.68	$726.31	$522.90
February	579.95	746.70	646.00	568.58
March	525.70	685.74	526.40	504.00
April	670.25	774.93	588.18	506.45
May	589.84	797.74	577.66	589.05
June	695.63	891.24	631.26	521.64
July	661.50	1,079.13	650.35	693.22
August	1,001.00	905.11	658.35	987.21
September	778.49	715.63	560.70	855.22
October	1,062.15	652.38	393.75	817.43
November	750.66	754.90	469.35	978.95
December	726.43	655.77	504.00	778.05

ELECTRIC CUSTOMERS

	1912	1913	1914	1915	1916
January	63	1,131	1,555	1,692	1,764
February	125	1,180	1,554	1,696	1,745
March	165	1,224	1,551	1,706	2,681
April	195	1,262	1,551	1,708	2,678
May	335	1,289	1,507	1,698	2,623
June	450	1,383	1,507	1,673	2,565
July	578	1,348	1,480	1,654	2,428
August	625	1,364	1,502	1,628	2,407
September	707	1,402	1,523	1,636	2,519
October	767	1,480	1,602	1,694	2,618
November	895	1,492	1,661	1,742	2,657
December	1,001	1,532	1,671	1,745	2,670

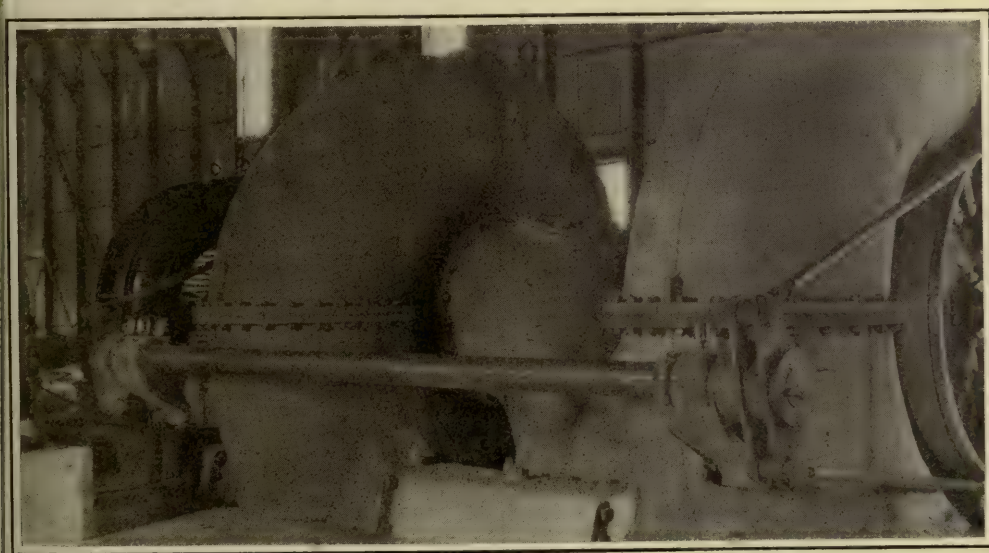


EIGHT-FOOT DIAMETER WOOD-STAVE PIPE PENSTOCKS BANDED WITH ¾-INCH STEEL; EUGENE, ORE., HYDROELECTRIC PLANT

$150,000, with an initial payment of $50,000, which was paid out of surplus electrical earnings, the balance of $100,000 to be paid for at the rate of $1,250 per month, or more if the Board so desired, and interest on the balance due to be computed on a deferred basis at 5 per cent. The interest, however, is not to become due until the principal is paid. The interest item, when due, is to be paid at the same monthly rate as the principal—i. e., $1,250 per month.

The gross annual revenue of the business purchased represents a total of over $30,000. As the operating expenses of conducting the combined systems is not much greater than the original unit, it can readily be seen that the business purchased is actually buying itself.

It has been the endeavor of the Board



FRANCIS-PELTON TURBINES IN GENERATING STATION, EUGENE WATER-WORKS

and the organization to give the best possible service in all departments of the business. The basic principle is that the utility belongs to the citizens; that all consumers should receive the same equitable treatment at a rate consistent with good business upon a substantial basis. Considerable time and trouble is constantly taken to keep in touch with consumers, advise them in their installations, test meters without additional expense to such consumers, and in numerous ways to work towards the customers' benefit.

During the years of competition, prior to the purchase of the competing system, clean lines of procedure were strictly adhered to in each and every case. No small tribute was paid to the organization by one of the officials of the competing corporation, before a gathering of public utility men, when in speaking of his experience with our competing municipal plant, his words were, in effect that "while the competition encountered was keen, yet it was of the cleanest kind possible."

The municipal plant has been responsible for the reduction of rates for lighting service from a maximum of 15 cents per kilowatt hour, to 8 cents per kilowatt hour, and a similar proportionate reduction in power service, thus saving the citizens thousands of dollars annually.

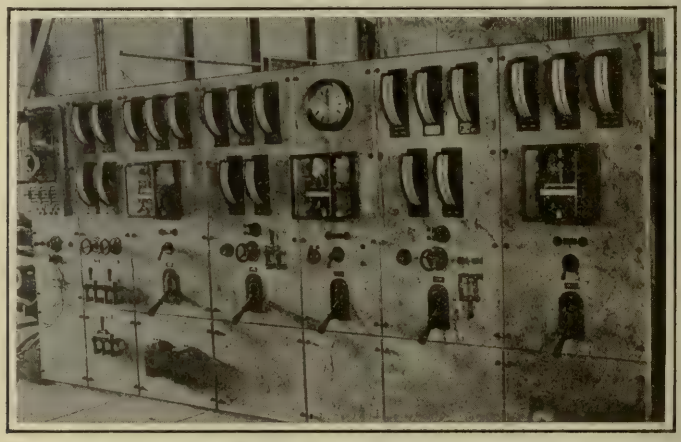
Not a dollar of taxes is required for the operation of the plants, both systems being absolutely self-supporting.

The public or the taxpayer pays for the public use of light and water out of general funds, the same as any other consumer, but on a net cost basis. A strictly separate accounting system is maintained for each department and is conducted as tho they were two foreign departments.

It is surprising how municipal ownership is growing thruout the country. Nearly every issue of journals and publications pertaining to municipal utilities and other municipal interests has some note of how this or that town or city is considering the installation of a municipally owned utility, or is about to let contracts; also in a few instances where some municipality has abandoned municipal ownership.

Instances of abandonment and reverting to corporate ownership are becoming fewer each year, largely because of improvements in administrative methods. Communities have learned by the experience of others, and in a great many cases by their own, that politics is the bane of municipal utility success. They have learned that the public as well as the private consumer should pay to the utility its equitable proportion in rates for service; that diversion of funds to other municipal purposes cannot be tolerated; that administrative heads should be chosen and organization should be built upon merit and ability alone; that a municipal utility should, and can be, operated more efficiently and economically than one of corporate ownership.

The control, operation and management should be entirely independent of any source



SEVEN-PANEL VERMONT MARBLE SWITCHBOARD, EUGENE HYDROELECTRIC STATION

iat has its inception in politics. A com-
iission, consisting of not less than five
iembers, should be elected by the people
n a strictly non-partisan basis, and the
:rm of each member should be at least five
ears, for it requires a year or two for a
onscientious commissioner to become thor-
ughly conversant with public utility man-
gement. Such a commission should be
esponsible only to the people, and by no
ieans to any other portion of the city gov-
rnment. Under such an arrangement
ood, substantial and intelligent citizens will
onsent to serve and take an active interest.
Ve are not aware of a single case of muni-
pal ownership failure under such an or-
anization and management.

An infinite amount of tact and patience
required on the part of the managing
fficer in dealing with the public, for at
mes it seems as tho the impossible is ex-
ected of a municipally owned utility. On
ccount of each citizen's being a share-
older, as it were, in such an enterprise,
iere are some who seem to think that they
ndividually have the absolute right to dic-
ite the policy.

A utility investment of from two or three
undred thousand to a half-million dollars
equires the best possible organization along
echnical and business lines, and municipal
wnership is handicapped in many cases in
not being able to build up such an organization. More or less criticism is encountered on account of the expense necessary to maintain an efficient force. The fact that such an organization may save its own cost many times over each year is very seldom given credit. A corporation may maintain an organization at twice the necessary cost, but no objection is raised on the part of the consumer.

One of the last, but not least, of the important items of successful municipal utility ownership management is the adoption of a principle such as was put into effect by the Eugene Water Board, that the general superintendent or executive head is held personally responsible for the entire management of the utility, and that no interference of any kind is practiced or tolerated by any influence whatsoever towards the appointment of technical assistants and other help. The superintendent is given a free hand to hire and arrange his organization as may be necessary, tho it is understood that the matter of salaries and wages is subject to the approval of the Board. Such a policy places the executive on his own responsibility as to the efficiency and effectiveness of the organization at his command. It has been proved in practice that under this arrangement the most efficient results are obtained, as no excuse for failure or lack of efficiency can prevail.

Dual Status of Municipalities

That a city, by entering upon an enterrise within the scope of the business of a rivate corporation, does so with rights iore restricted and liabilities broader than pply to the ordinary functions of munici-al government is now a well-established ule of law. This rule was recently recgnized by the United States District ourt for the Southern District of Califoria in litigation between the city of Los ngeles and the Los Angeles Gas & Elecric Company.

Apparently, the company occupies certain treets by virtue of franchise rights. The ity, under a plan for the operation of a ompeting lighting plant, adopted an ordinance and gave the company notice, requiring the company to remove its poles from the streets to make way for the city's poles. But the company has successfully resisted these steps, the court holding that when the city stepped aside from its ordinary police and governmental functions to engage in a commercial enterprise, it became subject to the same limitations that would apply to a private corporation engaging in the same enterprise, and that the city could no more destroy the gas and electric company's vested rights by compelling removal of that company's poles than a new private corporation competing with the old company could.

Motorized Municipal Essentials

DUPLEX HOOK AND LADDER TRUCK USED IN HARRISBURG, PA.

A ROBINSON HIGH DUTY ENGINE FOR NEW YORK CITY

SOUTH BEND COMBINATION TRUCK OF RINGGOLD HOSE COMPANY, IN NEWBURGH, N. Y.

PACKARD TRUCK IN USE BY NEW ORLEANS DOCK BOARD

5-TON INDIANA AUTO FLUSHER AT DALLAS, TEXAS

8½-TON FEDERAL TRUCK OWNED BY THE CITY OF NEW YORK

News and Ideas for Commercial and Civic Organizations

Fertilizer Sold by Hannibal Chamber

HANNIBAL, MO.—The Hannibal Chamber of Commerce and the farmers in the vicinity of Hannibal have had a higher appreciation of the value of coöperation since last summer, when the Chamber carried on an extensive campaign for a greater acreage of wheat and made possible the liberal use of fertilizer as a means of increasing production, as urged by the Government.

A contract for a large quantity of fertilizer was made with one of the leading fertilizer companies by the Chamber of Commerce, which sold the fertilizer to the farmers at cost. This effort made it possible to distribute a train load of fertilizer —37 carloads, containing 600 tons and amounting to $15,000—among three hundred farmers in Marion, Ralls and Monroe Counties of Missouri. This action enabled the farmers not only to get the kind of fertilizer they wanted, but to get it at a fair price. The best grade of bone fertilizer was provided by the Chamber of Commerce and was sold to the farmers for less than $30 a ton, while farmers who bought thru other sources were obliged to pay as much as $36 and $37 a ton, because of the great demand for fertilizer last year.

HARRY A. SCHEIDKER,
Secretary, Hannibal Chamber of Commerce.

Annual Dinner Abandoned for Sake of Charity

NEW YORK CITY.—Because of the great need for conserving food, time and effort just now, the Chamber of Commerce of the Borough of Queens has decided not to hold its regular annual dinner this year, but to collect a fund from those who would have attended the dinner and donate the sum to the Red Cross. The annual dinner of the Queens Chamber has always been an important occasion, at which are brought together several hundred representatives of the principal business interests, not only of Queens, but of all parts of New York City. These gatherings have been held each year either in the grand ballroom of the Waldorf-Astoria or of the Biltmore Hotel, and men prominent in national, state and city affairs have been among the Chamber's guests and speakers.

The card form reproduced herewith has been used in raising the fund:

CHAMBER OF COMMERCE OF THE BOROUGH OF QUEENS
William J. Hamilton, Treasurer
Long Island City, New York

Enclosed herewith please find my check for $_____
as a donation toward the work of the Red Cross, in lieu of my subscription to the Seventh Annual Dinner of the Chamber.

_____

WALTER I. WILLIS,
Secretary, Chamber of Commerce of the Borough of Queens.

The Queens Chamber of Commerce ha received letters from President Wilson an Secretary of War Baker expressing thei hearty approval of this action.

A Remedy for Farm Labor Shortage

LISBON, OHIO.—A method of remedyin the shortage in farm labor, which has s greatly handicapped agriculturists and cu tailed the production of foodstuffs, has bee worked out by the Lisbon Communit Chamber of Commerce and is strongl recommended to the consideration of oth commercial organizations. The Chamber efforts in this regard were begun, in fac before either the state or national defen organizations were formed.

Committees were appointed to make thoro canvass of the rural communities a jacent to Lisbon to ascertain how much a ditional help the farmers needed. The loc merchants were next visited, and they we asked how much time they could spend du

PHILLIPS UNIVERSITY LIBRARY

ng the following summer on the farms. The names of 110 men and 50 boys were secured, who pledged themselves in most cases to give ten days of their time. The names of the farmers who required help and the names of the available helpers were card-indexed by the Lisbon Chamber, which became a farm employment bureau for the time being. Word was then sent to the farmers to "Go to the limit in increased acreage—we will take care of you." With some misgivings, possibly, the farmers took the advice at its face value. Not a single call for help was refused.

A number of public-spirited citizens donated the use of their automobiles for the purpose of carrying the town workers to and from the farms. In this way, several squads of men were able to do a full day's work fifteen miles from home, going and returning the same day. As many as sixteen automobiles and thirty-two men have been engaged in a single day's work. The men were employed in every branch of farm work, from hoeing to baling hay. A large territory—about 10,000 acres—was successfully covered; 87 farmers were benefited, and 507 days' work was done by the farm militia. The average pay was $2 a day, with two good meals besides.

The plan had the additional result of bringing the Chamber into closer touch with the rural population, enabled it to discover their needs, and was mutually beneficial.

E. W. YEAGER,
General Secretary, The Lisbon Community Chamber of Commerce.

Community Building Purchased by Board of Trade

WASHINGTON, PA.—The Washington Board of Trade has become the owner of the community building which it was instrumental in placing at the disposal of the residents three years ago. The community building property was purchased at that time by fifty public-spirited men of Washington, who comprised the stockholders of the Washington Development Company. The company was organized for the purpose of purchasing the property and adapting it for use as a community center. An agreement was made with the Board of Trade whereby the latter organization would take care of the expense of maintaining the building as a community center. It was the intention that the Washington Development Company should hold the property only until such time as a plan could be devised whereby the Board of Trade could secure title to it. A condition of the purchase

THE COMMUNITY BUILDING, WASHINGTON, PA.

agreement, which was approved by the Board of Trade members, was that the building must always be used for the benefit, welfare and advancement of the residents of Washington and the adjacent territory. This stipulation guarantees the permanency of the community building, which is now universally recognized as an indispensable institution in Washington. The transaction will also assure the Board of Trade a permanent home.

An item describing the building and its uses was published in THE AMERICAN CITY in January, 1915.

WARREN R. JACKSON,
Managing Secretary, Washington Board of Trade.

A Hotel Built by the Citizens

OTTUMWA, IOWA.—The citizens of Ottumwa have just finished building a new hotel in the center of the city with the $330,000 which they collected for that purpose, and Ottumwa is a city of only 25,000 people. Successful hotel building by committees of a commercial organization is a

new idea in community development. The hotel was opened to the public last September. It was leased for a term of twenty-five years at a rental that guarantees the two classes of bondholders 6 per cent and 5½ per cent interest and the stockholders approximately 5 per cent interest, which is considered a fair return for the men and women who invested and were not looking entirely for financial profit.

Incidentally, the Ottumwa people, thru their committees, got much more than a new hotel for their $330,000. A collection of nondescript buildings which occupied one of the main blocks in the heart of the city were torn down, and in their place was raised this modern hotel—a symmetrical structure that would do credit to any business block.

THE HOTEL WHICH WAS BUILT AT OTTUMWA, IOWA, BY A COMMITTEE OF CITIZENS

This hotel was built by the citizens after a regular old-fashioned town meeting held at the Commercial Club. Not one in ten thought the city could do it. Then at the right moment that always comes when a crowd of men are gathered together, talking things over, one of the business men made the announcement that his firm would take $10,000 worth of hotel stock if four other firms would agree to do the same. That was the push that put the hotel proposition over the top of the hill.

When the soliciting committees had raised $90,000 and it seemed that everybody in Ottumwa had subscribed every cent that everybody expected him to, another business man made the announcement that there were twenty-five men in Ottumwa who would agree to stay away from their offices for three whole days and attempt to raise more money for the hotel. As a matter of fact, thirty men responded. The goal was set for $125,000. At four o'clock on the afternoon of the third day the subscriptions amounted to $125,000. The chairman allowed the committees to finish out the day, however, and by nightfall the subscriptions had run up to $154,500. In all, 309 Ottumwans had subscribed toward the project. The average subscription was $500. By Tuesday, September 4, 1917, the Hotel Ottumwa was ready for business. It is a success as a hotel and a success in coöperative action.

M. L. TOULME,
Secretary, Ottumwa Commercial Club.

A Full-Time City and County Health Officer

Helena, Ark.—Helena has been fortunate in securing the services of Dr. Vernon Robins, a well-known sanitarian, as city and county health officer. The movement was initiated by the Business Men's League and the Rotary Club. Both the city health officer and the county health officer, each of whom received a nominal salary of $50 a month, resigned their positions in order that a full-time man might be employed. The state health board has approved the plan, and the city and county government have provided a well-equipped laboratory for the use of the new health officer. His salary will be $3,000 a year, the money to be paid by the city, the county, the Helena School Board, the Board of Trade and the Business Men's League.

Dr. Robins will not attempt to do any practice work, other than that of making bacteriological tests for physicians in the community. That work should net him about $600 in addition to his salary. It

oped that his salary may be brought up to 5,000.

Helena and Phillips County now have the nly full-time health officer in Arkansas.

L. J. PENNEY,
Secretary, Helena Business Men's League.

A CAR EFFICIENCY POSTER PRINTED BY THE CHAMBER OF COMMERCE OF THE BOROUGH OF QUEENS, NEW YORK CITY, FOR DISTRIBUTION AMONG SHIPPERS AND RECEIVERS OF FREIGHT

Rail Freight Data Secured

STOCKTON, CAL.—Ordinarily it is like try-ıg to square the circle or find the fourth imension to attempt to secure information rom the railroads regarding the movement f freight. For many years the Stockton hamber of Commerce has realized the de-rability of getting data on the volume of reight traffic handled by the rail carriers, ut the railroads have always been averse o issuing their statistics, not caring to re-eal the volume of their business for the enefit of their respective competitors. De-ailed reports covering the commerce of the an Joaquin River have always been avail-ble, because the water transportation com-anies are required to furnish their figures o the government. The carefully analyzed nnual reports of the District Engineer Of-cer of the War Department contain com-rehensive data on every commodity handled on the river. They show the tonnage, the amount in the customary units, the value, the tonnage for which rates and distances are known, the average haul, and the rate per ton mile; they also give data on the character of the vessels handling the traffic. This complete information, of great interest and value in the work of the commercial organization—for the Chamber each year gives wide publicity to the report—serves only to emphasize the unfortunate lack of information on the movement of freight by rail.

This year the Chamber of Commerce took the matter up again with the agents of the railroads. The Chamber volunteered to keep strictly confidential such data as the railroads might furnish and to publish only the totals, a plan to which, the Chamber suggested, there could be no possible objection on the part of the carriers furnishing the information. One by one the three transcontinental railroads and the three interurban lines acceded to this suggestion, and in a surprisingly short space of time the long-desired information was in hand.

The announcement of the figures showing the volume of freight forwarded and received at Stockton, and giving the principal items of outgoing and incoming freight, excited lively interest among the business men of the community. For the first time, the commercial interests of the city had an opportunity to compare the volume of freight moving by rail with that moving by water. Perhaps the most impressive feature of the statistics was the fact that over 44 per cent of the entire movement of freight in and out of Stockton last year was carried on the river. Of the entire traffic, amounting to 1,834,644 tons, 1,010,422 tons were handled by the rail carriers and 824,222 tons, valued at $42,-179,160, were handled by the river transportation companies.

The facts revealed by these figures have furnished much additional "ammunition" to the Stockton Chamber of Commerce in the furtherance of its project for the deepening of the Stockton channel and the San Joaquin River along the few miles necessary to enable ocean-going vessels to dock at Stockton's municipal wharves. When it is realized that a little less than half of Stockton's freight business is now being handled in a 9-foot channel, little imagina-

Modern Lighting Methods

THE OLD WAY

Two sets of poles.

Tubular steel for supporting trolley wires.

Cast iron standards for lighting.

DOUBLE EXPENSE

Unnecessary obstruction along the curb line.

Underground wiring absolutely necessary.

Difficulty of keeping both sets of poles in alignment.

THE ELRECO WAY

One set of Elreco combination po

The addition of ornamental brac and base transforms the ordinary pl trolley pole into a handsome light standard.

"White Way" is obtained at less tl one-half the cost of a separate insta tion.

Lighting wires may be attached top of poles—saving all expen underground construction.

Curb line free from all unneces obstruction.

Get full details and catalog

Electric Railway Equipment Co

Manufacturers **Cincinnati, Ohi**

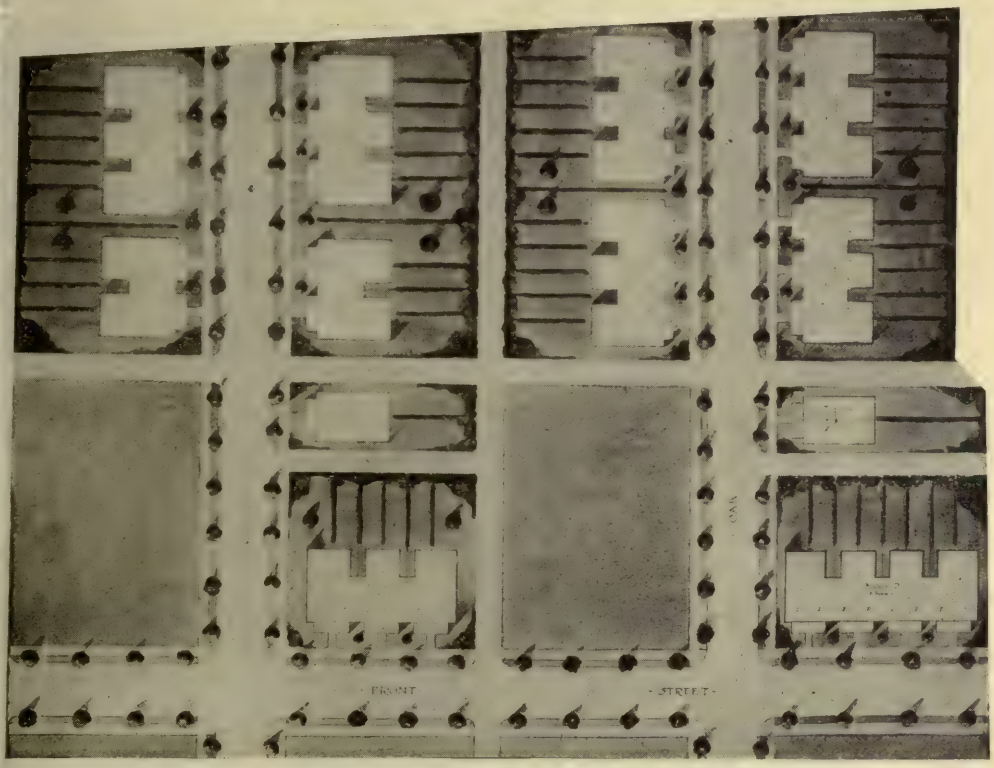
NEW YORK OFFICE **30 CHURCH STREET**

tion or optimism is required to forecast the potential development of river traffic in the 20-foot channel that the Stockton Chamber of Commerce and other leaders of civic affairs in the community have been working to secure for many years. Congress last year authorized a preliminary examination of the project, and the necessary rights of way for the widening of the channel have been secured by the Stockton Chamber.

NORMAN F. D'EVELYN,
Publicity Manager, Stockton Chamber of Commerce.

three types of exterior architectural grouping.

Several factors had a bearing in determining the committee's recommendation of the group type for this housing. Among them were the apparent success of the group idea at Forest Hills Gardens, N. Y., and in the industrial village at Marcus Hook, Pa. Another factor was the high cost of individual and double or semi-detached house construction, ascertained by careful investigation; and another, the expressed preference by local home hunters



THE GROUND PLAT OF THE HOUSING DEVELOPMENT AT LEBANON, PA.

Bungalow Group Housing at Lebanon

LEBANON, PA.—Thirty-six homes in the housing plans formulated by the Lebanon Chamber of Commerce are now under construction at Lebanon as the first unit of a total of sixty-two houses which will be built in the first plot of this development. The result of several months of study and work on the part of the Lebanon Chamber's housing committee is shown in the accompanying illustrations of the ground plat and of

for a home in a group plan because of the protection from cold in winter and from heat in summer afforded when the outside exposures are only at the front and the rear.

The Lebanon Chamber's committee therefore asked for competitive plans from its member architects and others for group instead of the old-time row types of houses. The plans and plot layouts submitted by the Stetler-Mengel Company, of Reading and Wyomissing, Pa., were selected. While not so elaborate as the groups at either Forest

Do You Clean Your Catch Basins?

How Do You Do It? What Does It Cost?

READ THIS PAGE AND THINK IT OVER

THE OLD WAY

CLEANING CATCH BASINS BY HAND.

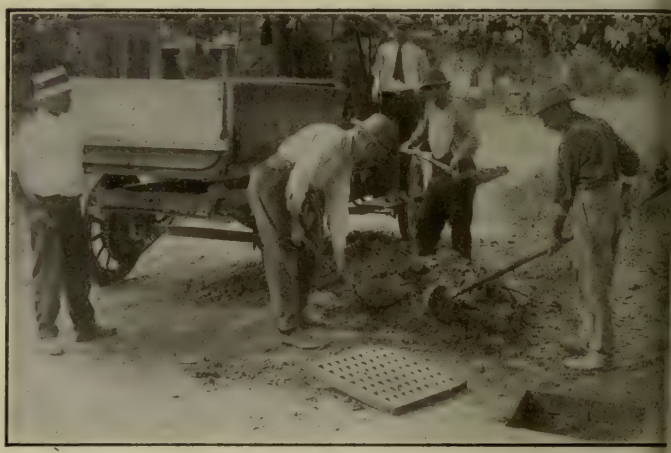
SPREADING DISEASE AND PESTILENCE.

FILTHY

DANGEROUS

COSTLY

AVERAGE COST $3.00 PER BASIN



THE NEW WAY

CLEANING CATCH BASINS WITH THE OTTERSON AUTO-EDUCTOR.

NO MENACE TO PUBLIC HEALTH

SANITARY

EFFICIENT

ECONOMICAL

AVERAGE COST $1.00 PER BASIN

THE OTTERSON AUTO-EDUCTOR CO.

817 Fairbanks Building SPRINGFIELD, O.

Hills or Marcus Hook, they present a cosy, homelike appearance, being of the group bungalow type.

A majority of the house groups will contain either four or six homes, and there will be one group of eight homes and two groups of two homes each in the first unit of construction. Between the groups in a city block will be a light, air and lawn space of about ten or twelve feet. At the street and alley sides there will also be a lawn strip, instead of having the house wall abut on the lot line. The groups will be set back at least fifteen feet from the front lot line. The contract calls for the landscaping and tree-planting of the lots and parking strips, and for concrete walks in front and gravel or cinder walks in the rear.

ONE OF THE SIX-HOME GROUPS AT LEBANON, PA.

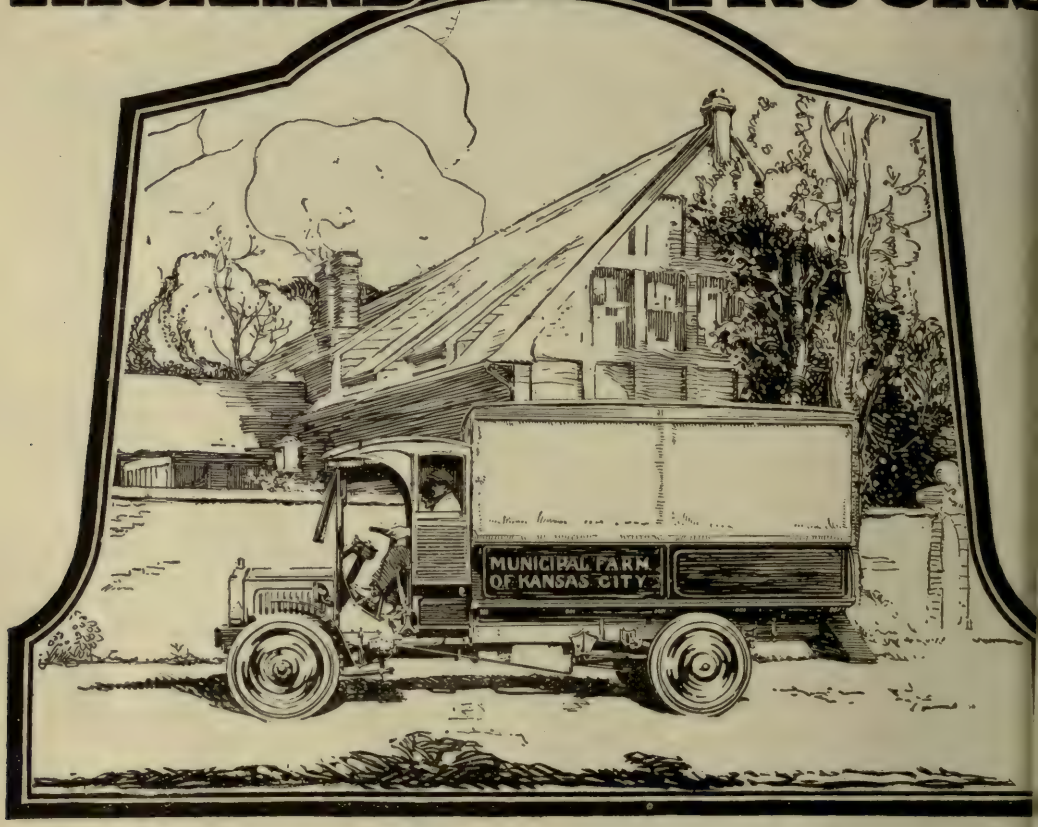
A FOUR-HOME GROUP AT LEBANON

The individual houses will be approximately alike in interior design. Each is to contain six rooms, a cellar under the entire house, an individual hot-air furnace, bath and complete plumbing, electric light including fixtures, gas in the kitchen, and front and rear porches. The construction will be of brick on a limestone foundation, and a solid brick wall will separate each house from its neighbor. The wall facing will be of pressed brick, select brick or stucco. It is thought that with this variety of exterior finish, the varied architectural designs, and the landscaping and group settings decided upon, an attractive suburban district will be created.

The houses in this unit, completely papered and with the improvements described, have been selling at prices ranging from $2,875 for the inside homes to $3,150 for the end houses at the street corners. Arrangements have been made with the Myerstown Trust Company for financing the first mortgages on the houses. That company will also serve as the trustee for the entire operation. Plans are being worked out for financing the second mortgages for the purchasers so that the aver-

ANOTHER TYPE OF SIX-HOME GROUP

PACKARD TRUCKS



Double duty! The more work the large the economy of Packard trucks

"In spite of constant use for five years—averaging seventy miles a day —our two-ton Packard truck is still in very good condition," says Supt. J. O. Stutsman of the Municipal Farm of Kansas City, Missouri.

"In addition to transporting inmates from the courts to the farm, all its spare time is employed in carrying supplies used on the farm and in delivering the vegetables we raise to the various city institutions. It also carries the farm officers to and from t car lines in the morning and evenir

"Summing up our experience this advance in economy and mun pal service, I believe that it would impossible to do the same work advantageously with several team

Seven *economical* sizes in sile chainless trucks—all with four-sp transmission. Phone the dealer in y city or write to Packard Motor Car C Detroit. *Ask the man who owns c*

Packard

age wage-earner may own his own home without incurring any greater financial burden than if he were paying rent.

The housing project has been made possible by several Lebanon citizens who have bought houses, not for their own use or for investment, but in a purely public-spirited desire to assist in Lebanon's advancement and to help meet the urgent demand that had not been met by private builders. The operation appears already to have acted as a spur toward private home building, in a few instances on an extensive scale.

The Stetler-Mengel Company, designer of the plans, is acting as general contractor and superintendent for the operation. With one or two minor, unavoidable exceptions, the sub-contracts have been given to Lebanon firms.

W. L. SHAFER,
Manager, Lebanon Chamber of Commerce.

Board of Directors Pursues Delinquent Members in a Body

San Luis Obispo, Cal.—The way one of the problems of finance of the San Luis Obispo Chamber of Commerce was solved by the Board of Directors of that organization furnishes a story that may be of interest to other commercial organizations.

It all came about because at the end of the fiscal year in September last, the Directors found that a number of the members had been very delinquent in paying their dues, with no apparent intention of liquidating. How to get this outstanding money was a problem with which the Board had wrestled without result for several months. The suggestion that was finally made that the whole Board go out in a body after the delinquents almost gave the Directors heart-failure, but the novelty of the idea saved it, and in five minutes these busiest of professional and business men in the town decided to drop their private work for an entire day in behalf of civic development.

In this money-gathering delegation were the Mayor, who is also president of the Chamber of Commerce, two of the City Commissioners, the president of the Union National Bank, the president and the cashier of the Commercial Bank, the proprietor of the leading hotel, the pastor of the Presbyterian church, one of the leading realty men, a prominent attorney, a shoe dealer, a furniture dealer, a stationer, and two other prominent business men. A picture of the group is shown herewith.

On this occasion, the "drive of the Chamber of Commerce tank," as the event was afterward called, was led by City Commissioner H. B. Kirtland, chairman of the Chamber of Commerce membership committee. The Rev. Mr. Habbick acted as spokesman, and everybody, metaphorically speaking, carried a gun. The "action" be-

THE BOARD OF DIRECTORS OF THE SAN LUIS OBISPO (CAL.) CHAMBER OF COMMERCE WHO PARTICIPATED IN THE "DRIVE" FOR DELINQUENT MEMBERSHIP DUES

GMC
GENERAL MOTORS COMPANY
TRUCKS

An Example in City Equipment—

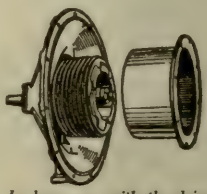
When Baltimore adopted GMC Trucks an unspoken testimonial was tendered the makers; for Baltimore, as a municipality is authoritative.

Baltimore has made remarkable civic improvements; has "come back" after a ruinous fire; has taught her city neighbors valuable lessons in city government—has recognized the inherent worth of GMC Trucks.

In the water department particularly, GMC Trucks are serving the city with profit and satisfaction.

GMC Trucks are also doing public duty in thousands of other city departments over the country. This is because every resource is drawn on by the factory to build in satisfaction.

Seven parts, exclusive of three small bolts and the plates make up the GMC Clutch. No lubrication is necessary.



In low gear, with the drive wheels locked the engine will stall before the clutch will slip.

Write to *Truck Headquarters.*

GENERAL MOTORS TRUCK COMPANY

One of the Units of the General Motors Corporation

New York Boston Philadelphia PONTIAC, MICH. **Chicago St. Louis San Francisco**

(293)

gan in the morning, with an intermission at the noon hour for luncheon, during which all were gathered at the Hotel Andrews as the guests of Director Gilliland. New members were secured on the way. Only three refusals were encountered, and the delegation was so congenial and jolly that the Mayor afterward said that he hadn't spent such a pleasurable day in months.

The "drive" attracted attention everywhere on account of the personnel of the men and the mission in which they were engaged. It lasted four hours, was featured in the press and was the talk of the town for several weeks. There is no way of estimating the psychological value of the impression made on the townspeople by seeing fifteen of the biggest business men of the community out in a body, away from their own private affairs during the busiest hours of the day, in the interest of the Chamber of Commerce. The results in cash and checks astonished the Directors. They are now convinced that enthusiasm and cooperation make a splendid team, and have decided that if their services should be needed again for the same purpose they would repeat the performance.

These men have been responsible for other effective community work done within the last year. A few weeks ago the initial steps were taken for the paving of one of the longest streets in the city, and a contract was let for the installation of a modern street lighting system. A county farm bureau has also been organized by the Chamber of Commerce, and satisfactory results have been obtained in a movement for better highways in the county.

CHARLES H. ROBERTS,
Secretary, San Luis Obispo Chamber of Commerce.

New Bulletins

BENTON HARBOR, MICH.—*Benton Harbor Advance*, official publication of the Benton Harbor Chamber of Commerce, published monthly.

BRIDGEPORT, CONN.—*Bridgeport Progress*, the official bulletin of the Bridgeport Chamber of Commerce, published monthly.

MANISTEE, MICH.—*The Manisteean*, published every six months by the Manistee Board of Commerce.

TROY, N. Y.—*Troy Chamber of Commerce Bulletin*, the official publication of the Troy Chamber of Commerce, issued monthly.

URBANA, ILL.—*Association of Commerce Bulletin*, published every other Monday by the Urbana Association of Commerce.

WALTHAM, MASS.—*Middlesex County Farm Bureau News*, published monthly by the Middlesex County Farm Bureau, Waltham, Mass. Walter P. Schatz is the Editor and Manager.

Recently Issued Printed Matter

BALTIMORE, MD.—In the October issue of "Baltimore," the bulletin of the Baltimore Merchants and Manufacturers Association, that organization presents its views "relative to the pending all-important proposition of the extension of the city limits of Baltimore."

DENVER, COL.—An illustrated booklet entitled, "Denver, the Distinctive," prepared by the City Service Bureau of the City and County of Denver.

GALVESTON, TEX.—The annual report of the Galveston Commercial Association for the year ending August 31, 1917, is published in the issue of October 1, 1917, of that organization's bulletin, "The Treasure Island Log."

GLENS FALLS, N. Y.—The annual report of the Glens Falls Chamber of Commerce for the year ending October 1, 1917.

MADISON, WIS.—Copies of the Recreational Survey of Madison, compiled by the civic and commercial organizations of that city some time ago, are still available to commercial organization secretaries. They can be obtained from the Madison Association of Commerce by forwarding ten cents to the Secretary, Don E. Mowry.

OIL CITY, PA.—A list of the accomplishments of the Oil City Chamber of Commerce during the four years of its history, ending July 1, 1917.

PATERSON, N. J.—A few of the laws and regulations of the city of Paterson governing the Board of Health, the Street Department, the Police Department, and the Fire Department, issued by the Paterson Chamber of Commerce for its City Beautiful Committee, with the coöperation of the Woman's Club and the High School Civic Club.

TITUSVILLE, PA.—The Titusville Chamber of Commerce has a so-called Members' Council within its organization composed of a Chairman, two Vice-Chairmen, Deputies and Minute Men, which is organized for the purpose of obtaining quick action in cases of emergency. The Chamber has just issued and distributed among its members an outline of the organization of the Members' Council, giving the names of the Chairman, Vice-Chairmen, Deputies, Minute Men, and Live Wires, with an explanation of how the plan is to operate.

WASHINGTON, D. C.—The 1917 Year Book and Directory of the Chamber of Commerce of the United States of America, containing facts and figures on commercial organization in the United States.

Firestone

PNEUMATIC OR SOLID TIRES FOR HORSE OR MOTOR-DRIVEN APPARATUS

The Test of the Elements

IN every climate, in every emergency, Firestone Tires have won the confidence and admiration of Fire Department men. They stand the extremes of heat and cold, the test of weight and speed, of short turns and slippery going.

You'll see them clad in ice at certain seasons or in certain lands, and you'll find them in the tropics. They mean most protection to men and mechanism, Most Miles per Dollar, and the certainty of getting on the job in quick time. Consult the Firestone man. He is near you and ready to serve. Write for catalog.

FIRESTONE TIRE AND RUBBER COMPANY
AKRON, OHIO BRANCHES AND DEALERS EVERYWHERE

The Importance of Well-Shaded City Streets

By James G. Bennem

IN the mental picture of a beautiful city or village, the tree has an essential part. Tree-lined avenues, tree-arched streets, the softening of stern façades, the play of light and shadow on the pavement, the screening of walk and window from the sun's glare, the lovely chronicle of the season's progress as it is written on the tree where all can read it—these are phases of beauty universal in appeal. The city's dependence upon their esthetic influence, even without considering the influence of single specimens which may be loved for beauty, association or old age, is the strongest argument for their planting and protection.

THIS PROPERTY, DEVELOPED TEN YEARS AGO, NOW HAS ONLY FOUR HOUSES—REASON, LACK OF TREE PLANTING

Many communities make this error of not giving sufficient thought to the planting of street trees, and of thus lessening the attraction of the place for the home-seeker

Responsibility for Street Planting

Somehow, we are slow to feel that the character of the inhabitants is always, in some degree, indicated by the appearance of their town. Unfortunately, it is, in most towns, no one's especial business to ornament the streets. No one feels it a reproach to himself that a rich curtain of verdure and beauty does not hang over the street in which he lives. Thus a whole village or town goes on from year to year, in a shameless state of public nudity and neglect, because no one feels it his particular duty to persuade his neighbor to join him in making the town in which he lives a gem of rural beauty, instead of a sorry collection of uninteresting houses with a few straggling specimens of trees.

Public improvements are generally carried on under two conditions: first, when nearly the whole of the population enjoy the advantages of education, as in New England; second, when a few of the more spirited and intelligent of the citizens take the burden in the beginning upon their own shoulders, set the example themselves, and zealously persuade all others to follow.

The villages of New England are as beautiful as any in the world, and readers visiting such places as Northampton, Springfield, New Haven, Pittsfield, Stockbridge and Woodbury will surely realize the importance of street trees. Take New Haven, the "City of Elms," as an example. A large part of these trees were planted by one person—Mr. Hillhouse. He lived long enough to see fair and lofty aisles of verdure where before were only rows of brick or wooden houses.

Aside from the importance of the esthetic influence of street trees, there are other reasons for planting them. Their presence or absence is a potent factor in determining the value of real estate. A small town in

Amercian-LaFrance Motor Fire Apparatus at Camp Dix, Wrightstown, N. J.

THE NATION'S EFFICIENCY IN THE PRESENT CRISIS

The nation's efficiency in the present crisis depends upon the ability of its industries to produce war materials and supplies, and to continue to do so without interruption.

The burden of protecting the industries of the country against delays and stoppage of production by fires rests upon the Fire Departments. Fire Departments efficiency depends largely upon the reliability and quality of its Fire Fighting Apparatus. *The Best is None too Good.*

Up to this date this company has furnished the United States Government with the following motor fire apparatus:

18 Pumping Cars
38 Chemical Engines
6 Combination Cars
1 Service Truck

—as well as some 200 hand-drawn chemical engines and several thousand hand extinguishers.

AMERICAN-LAFRANCE FIRE ENGINE COMPANY, INC.

Members of the National Automobile Chamber of Commerce. Licensed under the Dyer Patents

Elmira, New York, U. S. A.

Branch Sales Offices and Service Stations

New York Boston Chicago San Francisco Portland, Ore. Dallas
Los Angeles Atlanta Denver Pittsburgh Baltimore Minneapolis

CANADIAN FACTORY, TORONTO, ONT.

SILVER LINDENS ARE WIDE-SPREADING TREES PARTICULARLY ADAPTED TO BROAD RESIDENTIAL STREETS WHERE THE HOUSES ARE SET FAR BACK FROM THE ROAD

which shade trees are lacking or in poor condition offers no attractions to the seeker for a suburban home. Trees also have a sanitary value. The foliage inhales carbonic acid and exhales oxygen; as a result, the diseases incidental to heat are less prevalent in streets where there are large trees. The leaves also absorb the poisonous gases generated by the decomposition of animal and vegetable matter in hot weather. Their shade, which is pleasant to see, is also cool. There is less direct and reflected heat, and in the winter the trees actually radiate warmth.

Before planting new developments and replanting streets of towns, a landscape architect should be consulted. This would avoid unsightly places, with poor, dilapidated specimens of trees not adapted to the soil and the climate. Real estate men sometimes seem to have the idea that the cheapest tree they can buy will answer the purpose. They are slow to grasp the fact that having the streets properly planted is a strong point in persuading people to locate there.

Selecting and Planting Suitable Street Trees

Let us now consider some of the important points in selecting proper trees and in planting them.

Some societies claim that eight trees, two at each corner, should be planted at street intersections. The object is to form connected arches over both streets, where the dense shade would do the greatest good and the least harm; but the plan is destructive to vista, and would not do at all where the two streets are planted with different kinds of trees. As a general rule, the four-tree plan is the best. Along the block the trees should not be planted too closely. Medium-sized trees should be about 40 feet apart and larger-growing ones still farther apart, in proportion to their size.

Increased stateliness and charm are usually secured if the entire length of the street is planted with trees of one variety. This conclusion by no means involves the planting of one kind of tree thruout the municipality; indeed, a most important discovery is that different sections of the same city, tho of like character, are often favorable to the growth of entirely different sorts of trees. Much of the danger of the rapid spreading of injurious insects can be eliminated by planting the various streets with different kinds of trees.

Another more specific decision is that it is well in new planting to alternate trees of rapid growth with those which mature more slowly. The gain here is in securing shade and beauty on the street in the interim before the slower-growing trees reach maturity. As the latter increase in size and demand more room, the temporary trees, which have served their purpose, can be cut out.

Street trees should have symmetry of growth, stateliness, ample foliage, cleanli-

GOODRICH FIRE HOSE

Is so Often the Choice

of our best known fire chiefs that we cannot but feel that the silent testimonial tribute of each order automatically qualifies our classification of "WHITE KING" as second to none in the "blue ribbon" attributes so necessary in hard service Fire Hose.

We guarantee "WHITE KING" to give you as good service as any other make of *Cotton Jacketed* Fire Hose—or better—regardless of *Type, Style* or *Prices.*

Write Us—We can Prove It.

B. F. GOODRICH COMPANY

Makers of the Celebrated Goodrich Automobile Tires —*"Best in the Long Run"*

AKRON, OHIO

Representation Everywhere

ness and hardiness; they should be free from offensive odors, and usually in the northern cities should be deciduous, so that the wonder of spring may be an annual miracle. The tree commissioners of Washington, having substantially assumed these essentials, experimented with some thirty varieties of trees. Now nearly all the trees of the city can be included in a dozen varieties.

There is a fashion in trees which sometimes has an unreasonable sway. Hence, while we have the finest ornamental trees in the world growing in our native forests, it is not an unusual thing to see them blindly overlooked for foreign species that have not half the real charm and not a tenth part of the adaptability of the native trees to our soil and climate. The best and safest way is to select the finest indigenous trees which the soil and climate of the place will bring to perfection. It is because this principle has been pursued, perhaps accidentally, that the villages of New England are so celebrated for their sylvan charms.

There are no more superb trees than our American oaks—rich in foliage and grand in every part of their trunks and branches. Those who know them only as they grow in or on the skirts of a thick forest have no proper notion of their dignity and beauty when planted and grown on an avenue. There are many districts where the native luxuriance of the oak woods points out the perfect adaptation of the soil to this tree.

DROUGHT-RESISTING OAKS ON HEMPSTEAD PLAINS, LONG ISLAND
Places subject to long drought should be planted with trees which will hold their leaves thru the dry periods of midsummer

Another beautiful and stately American tree which one rarely sees planted in public streets is the tulip tree, or whitewood. It has clean and lustrous dark-green foliage, golden- and bronze-colored blossoms, and a finely proportioned trunk, smooth as a Grecian column. It is hard to transplant, but can be successfully moved by digging with a ball of earth about the roots. There are grand avenues of them in the royal

Transportation
is the foundation
of Progress

WITHOUT transportation we cannot have production; labor would be helpless.

Without transportation we cannot gather raw materials or develop unfinished products.

Without transportation we would practically stand still in economic and social development.

Transportation is one of the most important factors in building up any country.

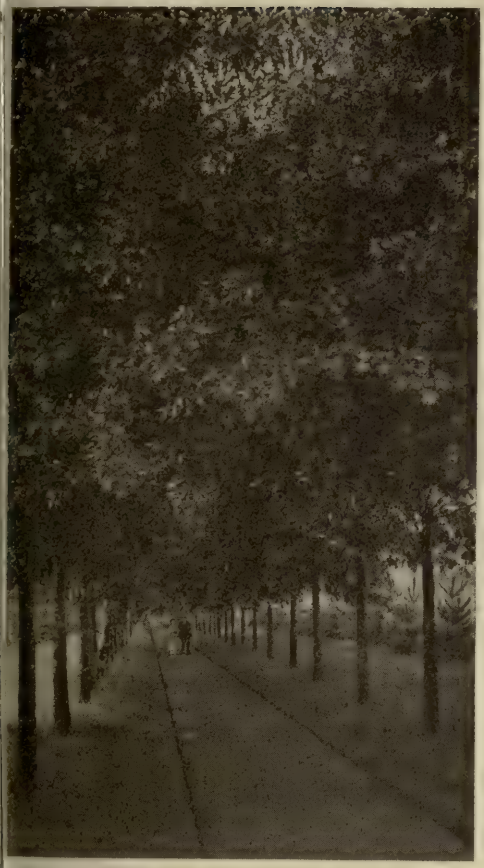
Today it is of still greater importance to the U. S. and the Allies in the winning of the war in which we are now engaged.

The public highway must take its place in our great system of transportation and to accomplish this we must build and maintain highways to meet traffic requirements.

Garford MOTOR TRUCKS

The Garford Motor Truck Company, Lima, Ohio

Manufacturers of Motor Trucks of 1, 1½, 2, 3½, 5 and 6 ton capacity. 4½, 7 and 10 ton Tractors
The Garford Road Builder



PIN OAKS MAKE BEAUTIFUL STREET TREES AND ARE ADAPTED TO BOTH MOIST AND DRY GROUND

parks of Germany, raised from American seed. For a village in a mountainous district, like New Lebanon, N. Y., the native white pine would produce a grand and striking effect. In Ohio the cucumber tree would make one of the noblest and most admirable avenues. In the South, what could be more captivating than a village whose streets were lined with rows of the magnolia grandiflora?

The variety of trees for densely crowded cities is small, chiefly because the warm brick and stone walls are such hiding-places and nurseries for insects that many trees, fine for the rural towns, become absolute pests in the city. The following is a list of trees suitable for cities, providing the climate and soil are adapted to their growth: oriental plane (or sycamore), Norway maple, scarlet oak, red oak, pin oak, ginkgo, liquidambar, American elm, sugar maple and ailanthus. Some people object to the last because it has strong-scented foliage. It is recommended because it is free from insect attack, keeps good foliage and is a fast grower.

The proper care of street trees involves many factors. It not only means correct pruning at the suitable season, but also takes into account the correct treatment of the soil, proper spraying to combat injurious insects and fungi, tree repairs, protection from injury, etc. In fact, the planting and care of trees is a subject requiring such special knowledge that this work in every town and city should be in the hands of a man especially trained in that sort of work. This man should be appointed by merit only, and the control should be kept out of the hands of politicians.

Communities that wish to put their trees in charge of an official commission can learn much from Paris. There nearly every tree is protected by a slight cast-iron or stick basket, and is provided, even on the business thorofares, with an iron grating about six feet wide which prevents the surface of the ground from becoming hard around the trunk. If there be a notion that trees are out of place on a crowded highway, personal investigation is likely to dispel it.

EDITORIAL NOTE.—The illustrations used in this article have been furnished by courtesy of Hicks Nurseries, Westbury, Long Island, N. Y.

The above three and one-half ton Federal is being used by Wheeler & Dreher, Atlantic City, to complete a paved road from Philadelphia to Washington, D. C.

Road Building Work Proves Federal S'amina

In few lines of work is the stamina of a motor truck tested so severely as in the heavy work of road building.

Because of their sturdy construction, economy and day-after-day reliability, Federals are used extensively in this type of work.

That their performance is uniformly satisfactory is proved by the large per centage of owners in this line who increase their haulage fleet by ordering "Another Federal."

Let Federal traffic engineers analyse *your* haulage problem for you.

Federal Motor Truck Co.
341 Federal Street Detroit, Mich.

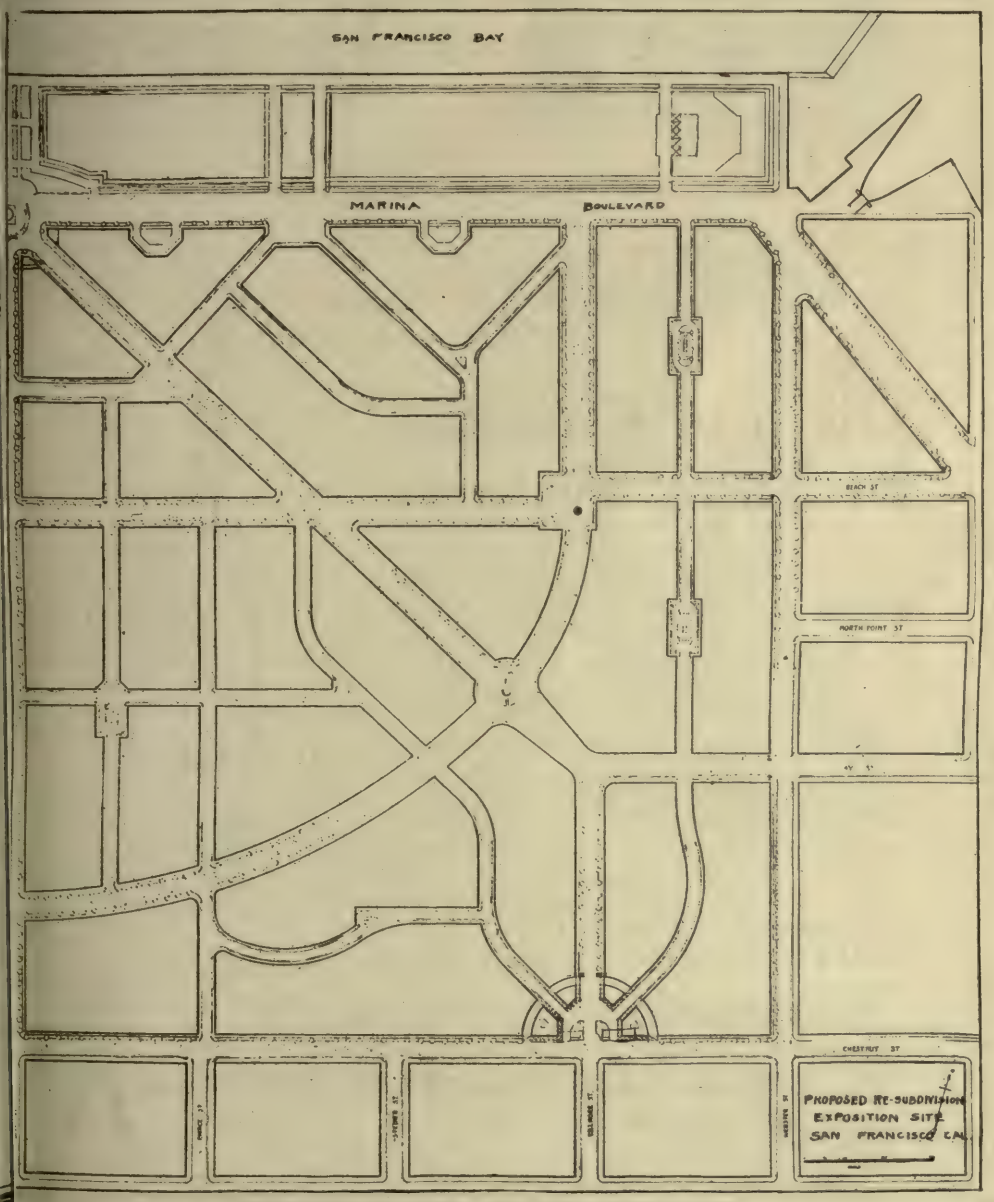
FEDERAL

One to Five Ton Capacities

Exposition Grounds Replanned as a Restricted Residence Park

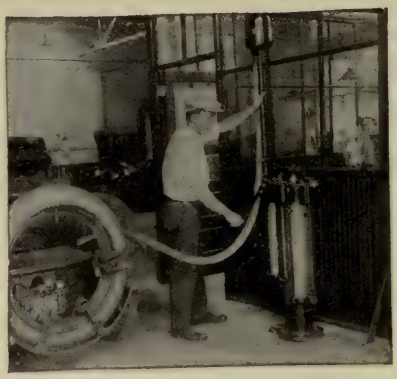
By M. M. O'Shaughnessy
City Engineer

ON account of topographical conditions the development of San Francisco's residential areas has been considerably restricted. The hills and the valleys have each attracted their quota of people according to personal tastes and inclina-



PROPOSED PLAN FOR NEW RESIDENCE PARK

Your City's Defens



BOWSER
ESTABLISHED 1885

Oil *and* Gasoline Storage Systems

Your city's safety from fires, caused by the ignition of volatile and inflammable liquids, such as gasoline, is governed by the conditions surrounding the storage of such i quids.

The only safe way to guard against this danger is to make sure that all such liquids are stored in Bowser Fire-Proof Steel Tanks.

Then, and then only, is the menace from fire removed—it is your city's protection.

Cut No. 101
5-Gallon Gasoline Pump for Indoor Use.

S. F. Bowser & Co., Inc., Fort Wayne, Ind., U.S.A.

Sales Offices in all Centers *Representatives Everywher*

ons, so that a series of small centers has rown up and become established entirely ithout coördination with one another or ith the city's commercial growth.

A recognition of these conditions has rought about the centralization of control f that portion of the site of the recent anama-Pacific International Exposition eld in private ownership, for the purpose f resubdivision into a restricted residence ark, to be known as Marina Gardens. The nusual features of this site, its large area, f over 200 acres, and its location almost the heart of the city on that incompar- ble body of water, San Francisco Bay, used its selection for the Exposition com- emorating the opening of the Panama anal. The result more than justified the oice of the directors, and its adaptation a residence park will undoubtedly prove ually successful.

The task of bringing together the inter- ts of the various property owners in the strict was undertaken by O. C. Stine, a ading real estate operator. The owners ere finally committed to a coöperative an which includes the closure of the ex- ting streets, the opening of new streets, rking spaces, boulevards and playgrounds d the establishment of business centers. he restrictions extend to the control of chitectural building lines, building loca- ons and street adornment to a much eater extent than anything heretofore at- mpted on the Pacific Coast.

The problems involved in planning the reet system were numerous, and certain cal conditions were sufficiently important make the task of meeting them one re- iring much consideration. For example, e prevailing winds of the district could t be allowed to sweep along any main tery, and yet it was essential that certain maining heritages of the Exposition be t visible as termini for properly framed stas. The problem of proper distribution traffic thru the district was in turn com- cated by the necessity of streets of chang- g direction, while it was imperative that e maximum view frontage on the Golden te be developed.

The principal features of the plan, which ere finally adopted after more than a ar's study, were a north-and-south axis ntering on the Column of Progress, and east-and-west axis passing thru the dome the Fine Arts Building. Both of these features will be recalled as ones that predominated their situations in the Exposition. At the eastern end of the east-and-west axis, centering on the Fine Arts Dome, is a plaza approximately one acre in area, from which a circular drive or boulevard distributes traffic to the secondary streets in the southern portion of the park. Courts have been planned at uniform intervals along the northern and eastern borders of the park in such a way as to create a succession of features along the two main boulevards, while at the same time giving the maximum amount of view frontage looking on the Marina Park and the grounds of the Fine Arts Building. On the southern boundary two business centers have been created, from each of which three arteries radiate to the main centers of the residence park.

It is proposed that the streets shall be paved and improved in the most modern manner and that all electroliers and other street ornaments shall be of special design. Public utilities will be installed underground. The plan incorporates some twenty-odd plazas or parks at street intersections, and includes eight or ten interior courts, which will be devoted to recreation.

On account of the reluctance of the owners to enter into the scheme, the first section of the project only is now under process of resubdivision. This covers about one-half the area of the whole plot and requires the closure of about 870,000 square feet of existing streets laid out in the rectangular system and the opening of about 860,000 square feet of new avenues.

The existing streets are uniformly 68 feet 9 inches wide, dividing the district into blocks 275 feet in width by 412 feet 6 inches in length. The new streets vary in width from 100 feet for the Marina Boulevard with a roadway of 51 feet, down to 40 feet for the small intermediate streets. The Marina Boulevard, passing along the northern boundary of the property, is an important link in the city's boulevard system.

It has been a herculean task to bring all of the property owners in the district to the full realization of the fact that proper planning and development of this area will result in financial gain as well as the beautifying of a large and important unit in the city, and too much credit cannot be given to those whose tireless efforts have made the completion of this plan possible.

The Fire Chief Knou

The chiefs of the various fire d
partments know that Republ
Fire Hose stands up.

They have tried it in the harde
service and it has always ma
good.

They know that Republic Fi
Hose is dependable because it
made by skilled workmen of t
best of materials.

Republic Fire Hose is made
several brands.

Each is worthy of the Repub
trade-mark.

Republic Fire Engine Suction Hose is
light and flexible and will withstand
the most severe pumping strain

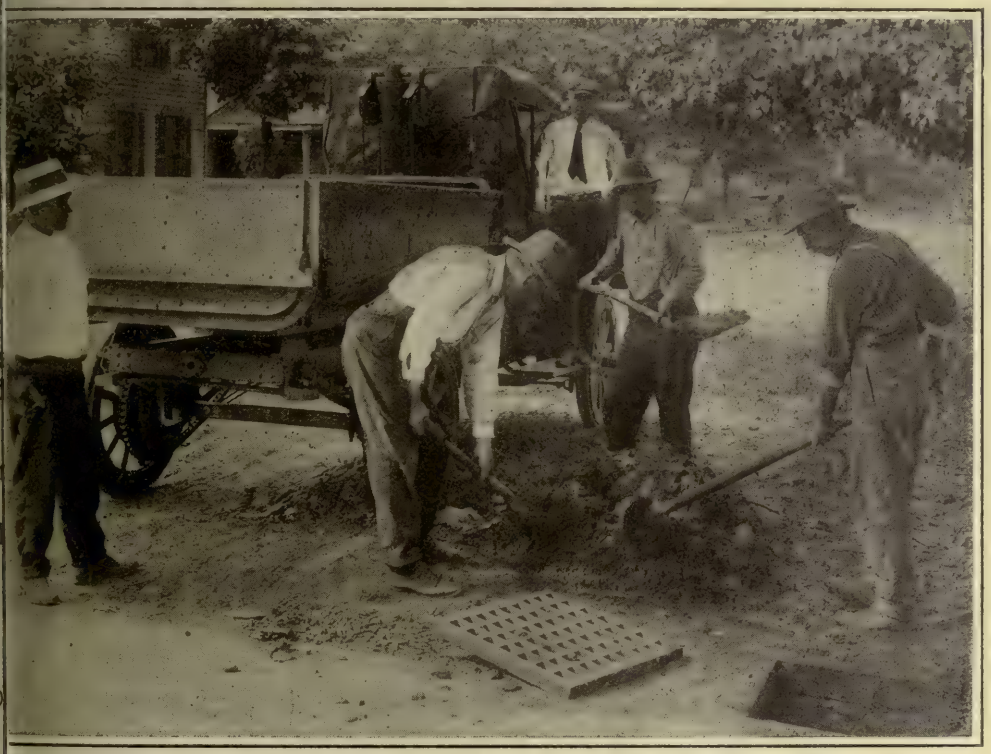
The Republic Rubber Corporat
Youngstown, Ohio
Branches in all principal cities

Methods of Cleaning Catch-Basins

Replacing Expensive Hand Cleaning with More Effective Mechanical Methods

THE rapidly increasing scarcity of labor, particularly common day labor, is causing more or less apprehension n the part of municipal officials thruout the ountry. This applies to labor in every deartment, and in no one division more than 1 others. Sewer departments feel the shortage and are turning to mechanical de-ices to perform their work effectively, just s road officials have adopted traction en-ines to haul their road machinery, thus educing the number of men required and ncreasing the amount of work performed.

The cleaning of catch-basins has always een one of the slow and expensive duties f the sewer department. The work is ecessary if the city is to be free from ewer stoppages, offensive odors and from he flooding of streets in times of heavy ain. Hand cleaning methods are crude, nefficient and generally expensive when performed by day labor receiving an average of 30 cents per hour per man. The gangs cleaning catch-basins usually consist of three or four men and one or two teams and wagons, costing an average of $16 per day and cleaning only four or five basins in a nine-hour day. The average cost for cleaning catch-basins in cities of over 25,000 population is about $4 per basin when done by hand.



CLEANING CATCH-BASINS BY HAND — EXPENSIVE AND UNSANITARY

Taking these facts into consideration, one must naturally turn to making use of machinery wherever possible. Most department heads are willing and ready to go ahead with the introduction of mechanical helps in the performance of the duties of their departments, but are hampered in many cases by short-sighted officials who think a large initial outlay for machinery is unnecessary.

There is in service in San Francisco at

SPRACO PNEUMATIC PAINTING EQUIPMENT

SPRACO Revolutionizes Painting Methods

THE Spraco pneumatic painting outfit is one of the most recent devices for reducing paint costs. The Spraco paint gun is a practical hand tool for use in applying all kinds of liquid coatings to smooth or rough surfaces.

The paint is "shot" on. Better work can be done in one-quarter the time required by the old hand-brush methods. The paint gun may be attached quickly to a fibre extension pole, by means of which the operator may reach inaccessible surface, such as walls and ceilings of buildings without the use of staging.

Ideal for all kinds of municipal painting and coating.

It's a great labor, time and money saver.

Write for complete information.

THE SPRAY ENGINEERING CO.

91 FEDERAL STREET :: :: BOSTON, MASS.

A MODERN, CLEANLY WAY TO REMOVE REFUSE FROM CATCH-BASINS

esent a machine which has been effective reducing the costs of catch-basin clean-g. Three men can operate the machine at average cost of $15 per day. This sounds pensive, but the machine will do the work several labor gangs and decreases the st of cleaning basins about 50 per cent. addition to its fitness for this work, by noving the cleaning mechanism the truck n be converted into a 6-cubic-yard body general hauling.

The general principle of the apparatus that of a portable ejector mounted on a otor truck in which the solids are retained d the water used over and over until the nk is filled with the waste matter. A suf-ient quantity of water is carried in the nk to last until the material removed from e catch-basins fills the body. Pressure r the operation of the water ejector is cured by means of a small pump located mediately behind the driver's seat and op-ated from the main engine. The operat-g pressure is about 55 pounds.

The motor truck on which the apparatus mounted is driven in as near a catch-sin as possible and the ejector pipe low-ed into the basin.

The operating lever is moved and as soon the pressure generated by the pump is sufficient the refuse is sucked up by the jet and discharged into the body, where it flows through baffle plates and screens, the solids settling and the water returning to the pump. Any excess water is discharged thru an overflow into the catch-basin. The suction device is held in position by a single set screw, and thus may be easily removed in case any stones or sticks are caught in it. This seldom occurs, as 2½-inch stones have passed thru without difficulty.

In connection with the work of a machine of this type in Chicago, Ill., the following data from George E. McGrath, Superintendent, Bureau of Sewers, are of interest:

COST OF THREE MONTHS' OPERATION

One chauffeur, 3 months, at $115 per month	$345.00
One laborer in charge of auto crew, 2 months at $3.60 per day	176.78
One laborer in charge of auto crew, 1 month, at $4.60 per day	112.95
One laborer in charge of auto crew, 3 months, at $3.30 per day	243.08
Total for labor	$877.81
Repairs, gasoline, oil, etc	308.08
Interest at 4 per cent on $7,000 (cost of Eductor)	70.00
Depreciation at 10 cents per mile for 1,380 miles	138.00
Grand total	$1,393.89

The Cleveland Lighting Plant's Admirable Showing

meet. Conventic
quarters will be in the Miami

CITY LIGHT GETS MILLION

Cleveland's 1017 Receipts to Equal One-Third of Investment.

Municipal light plant receipts will be nearly $1,000,000 in 1917, according to an estimate made yesterday by W. E. Davis, commissioner of light and heat.

"That is a marvelous showing for a $3,000,000 investment," said Commissioner Davis. "We cannot expect to increase our business in 1917 as much as we did in 1916 because the new equipment will not be ready before next year."

City officials are satisfied with the showing Commissioner Davis has turned over the annual report to Utilities Director T. S. Farrell.

We Can Do The Same For You!

We are Consulting Engineers for Municipalities.

We designed, built and operated the Cleveland Municipal plant. Its maximum rate is 3 cents per K. W. Hour.

We represent cities in negotiations with the Utility corporations.

We prepare valuations and represent cities before the State Commissions in rate cases for Electric Light, Gas, Telephone, Water Works and Railway Fare Cases.

Write for printed matter.

F. W. BALLARD & CO.

ENGINEERS

SWETLAND BLDG. CLEVELAND, OHI

WORK PERFORMED

Number of miles traversed, 1,380.
Number of catch-basins cleaned, 1,073 at $1.299.
Number of cubic yards removed, 1,763 at 79 cents.

The average cost for cleaning catch-basins during the last four years was $3.24 each. Using this price for comparative purposes, it appears that the city has saved $2,082.63 during the three months of operation.

This method of removing filth from catch-basins is far superior to hand removal, during which piles of refuse are permitted to remain on the streets for hours waiting for the return of the dump cart. It is encouraging to see apparatus of this type in use, conserving man power and distinctly appealing to the financial and esthetic senses of the average citizen and taxpayer.

Conventions and Exhibitions

On the Calendar

JANUARY 3-4.—TRENTON, N. J.
New Jersey State League of Municipalities. Annual convention. Secretary, Clinton J. Swartz, Trenton, N. J.

JANUARY 8.—NEW YORK CITY.
American Society of Landscape Architects. Annual meeting. Secretary, Alling S. DeForest, 222 Sibley Block, Rochester, N. Y.

JANUARY 14.—NEW YORK CITY.
American Institute of Consulting Engineers. Annual meeting. Secretary, F. A. Molitor, 35 Nassau Street, New York City.

JANUARY 16.—CHICAGO, ILL.
Western Society of Engineers. Annual meeting. Secretary, Edgar S. Nethercut, 1735 Monadnock Block, Chicago, Ill.

JANUARY 16-17.—NEW YORK CITY.
American Society of Civil Engineers. Annual meeting for election of officers. Secretary, Charles Warren Hunt, 33 West Thirty-ninth Street, New York City.

JANUARY 16-18.—BUFFALO, N. Y.
Association of Convention Bureaus. Annual convention. Secretary, Fred Houser, Secretary Convention Bureau, Atlanta, Ga.

JANUARY 18-19.—KANSAS CITY, MO.
Western Paving Brick Manufacturers Association. Annual meeting. Secretary, G. W. Thurston, 416 Dwight Building, Kansas City, Mo.

JANUARY 22-24.—NEW YORK CITY.
American Society of Heating and Ventilating Engineers. Annual meeting. Secretary, C. W. Obert, 29 West Thirty-ninth Street, New York City.

FEBRUARY 7-9.—CHICAGO, ILL.
American Concrete Institute. Annual meeting. Secretary, Harold D. Hynds, 27 School Street, Boston, Mass.

FEBRUARY 15.—TRENTON, N. J.
New Jersey Sewage Works Association. Annual meeting. Secretary, Frederick T. Parker, Guarantee Trust Building, Atlantic City, N. J.

FEBRUARY 21-23.—WASHINGTON, D. C.
National Society for the Promotion of Industrial Education. Annual meeting. Secretary, Alvin E. Dodd, 140 West Forty-second Street, New York City.

American Road Builders' Association

It has been decided to hold the fifteenth annual convention of the American Road Builders' Association at the Hotel Statler, St. Louis, Mo., during the week February 4-7, 1918. In view of the influences that have hampered highway construction during the last year or more, and the vital need of a system of road transportation to relieve the already overburdened railways, the coming meeting promises to be the most important in the history of the organization.

Owing to the difficulties of railroad transportation, it is felt by the Association that it should make no plans which would in any way interfere with the transportation of materials needed for war purposes. It has been decided, therefore, to abandon for this meeting the great exhibition of road building machinery, materials and appliances which, for a number of years, has been an important feature of the Association's conventions, and to limit the good roads show in connection with the forthcoming convention to such display of materials, models, photographs, literature, etc., as can be shown in the large ball room of the Hotel Statler. Another year, it is hoped that conditions will warrant holding the usual exhibition of machinery and materials.

While the convention program is only in a formative stage at present, sufficient acceptances have been secured to assure the attendance of speakers of international reputation in their respective lines. In addition to the technical men, it is planned to have leaders in financial and business circles address the convention on the commercial side of road building and, if conditions permit, it is expected that Government officials will also speak. The aim, in fact, of the committee in the preparation of the program will be to emphasize the importance of road improvement not only as a state- and nation-wide problem, but as a vital factor in national preparedness.

—yes, some twenty years ago

Twenty years ago, we made a big lot of Enameled Iron Street Signs for the City of Baltimore, but we haven't sold the City many since—only because

THE TOWN HASN'T NEEDED THEM

The signs we sold them twenty years ago are still doing business—that's the economy of "BALTO" Guaranteed Porcelain Enameled Iron Municipal Signs.

That's the proof that there is no "just-as-good."

If you can afford to experiment with low prices (?) you're fortunate, but the taxpayer pays the freight. Our product is the one absolutely dependable out-of-door municipal sign on the market, and we can prove it if given half a chance.

GIVE US THE CHANCE TODAY

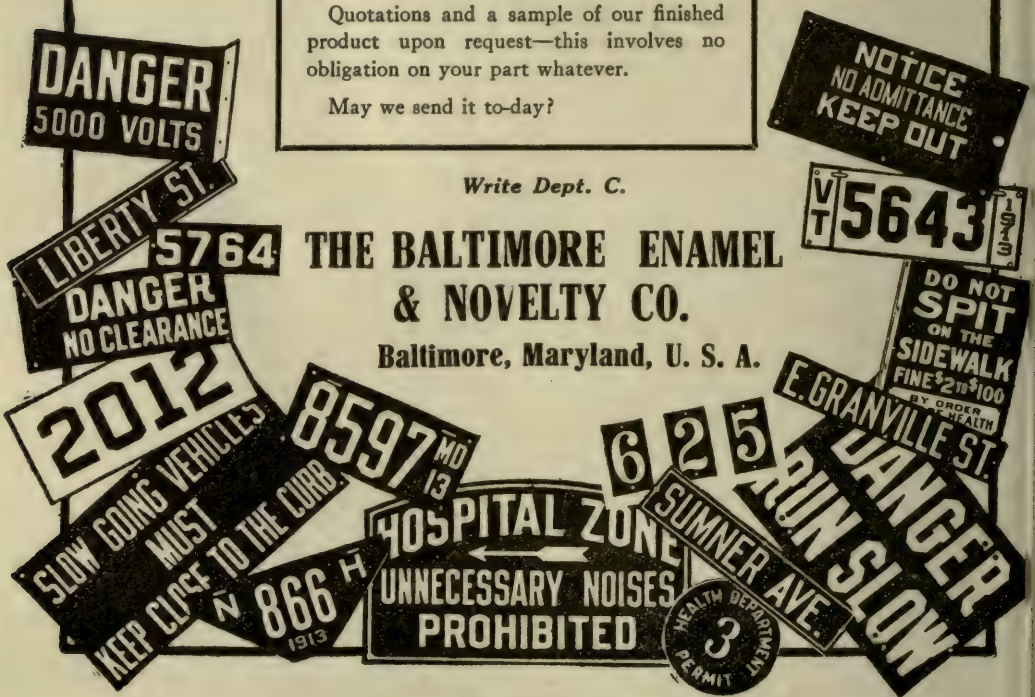
Quotations and a sample of our finished product upon request—this involves no obligation on your part whatever.

May we send it to-day?

Write Dept. C.

THE BALTIMORE ENAMEL & NOVELTY CO.

Baltimore, Maryland, U. S. A.



Pamphlets and Papers ot Civic Interest

See also the department of News and Ideas for Commercial and Civic Organizations

A Compilation of Garbage Disposal Data.

Garbage Disposal: A Report prepared by the Springfield Bureau of Municipal Research. July, 1917. 69 pp. Charts, statistics. (Apply to J. H. Hutchinson, Manager of the Bureau, Springfield, Mass.)

York's Sewerage System.

Report on Sanitary Sewerage System and Disposal Works, 1904-1916, City of York, Pennsylvania. 1917. Photographs and diagrams. 32 pp. (Apply to J. K. Giesey, Special Assistant Engineer, York, Pa.)

Street Traffic Regulations.

The National Safety Council has published a 39-page pamphlet under the above title written by William Phelps Eno, the well-known traffic expert. The pamphlet is an advance reprint of the more important points on traffic to appear later in book form. 1916. (Apply to W. H. Cameron, Secretary, 208 South LaSalle Street, Chicago, Ill.)

Road Materials—Forms for Specifications.

Standard Forms for Specifications, Tests, Reports, and Methods of Sampling for Road Materials, as Recommended by the First Conference of State Highway Testing Engineers and Chemists, Washington, D. C., February 12-17, 1917. (Bulletin No. 555, November 26, 1917, United States Office of Public Roads.) 56 pp. (Apply to the Office, Washington, D. C.)

American Road Builders' Association.

Proceedings of the Fourteenth Annual Convention of the American Road Builders' Association, Boston, Mass., February 5-9, 1917. 329 pp. (Apply to E. L. Powers, Secretary, 150 Nassau Street, New York City.) $2.00.

National Conference on Concrete Road Building.

Proceedings of the Second National Conference on Concrete Road Building, Chicago, Ill., February 15-18, 1917. Diagrams, statistical tables. 328 pp. (Apply to J. P. Beck, Secretary, 111 West Washington Street, Chicago, Ill.)

Road Problems in the Ozarks.

This is the subject discussed in the January, 1917, Bulletin (Volume 9, Number 1) of the School of Mines and Metallurgy of the University of Missouri. The article, comprising 17 pages, with photographic illustrations, was prepared by Elmo G. Harris, C. E., Professor of Civil Engineering. A list of "Publications on Rural Roads," compiled by Harold L. Wheeler, A.B., B.L.S., Librarian, is included. 23 pp. (Apply to the University's School of Mines, as above, Rolla, Missouri.)

Street Improvement in Ontario, Canada

Report on Street Improvement, Ontario, 1917. Publication No. 22. 200 pp. Photographs, charts, diagrams, statistical tables. (Apply to Ontario Department of Public Highways, Parliament Buildings, Toronto, Ontario, Canada.)

Sanitation and Sanitary Engineering

Revised and enlarged edition of Dr. William Paul Gerhard's book originally published in 1909. 1917. 175 pp. (Apply Book Department of The American City.) Cloth, $1.50; paper, 60 cents.

Publicity for New York State's Government.

Volume 1, Number 1 of "State Service," an illustrated monthly magazine devoted to the government of the state of New York and its affairs, was issued in August last. The November issue contains 96 pages, with many interesting articles and a number of illustrations. Published by the State Service Magazine Company, Inc., Lyon Block, Albany, N. Y.; James Malcolm, Editor. Subscriptions: $1.50 per year; single copies, 15 cents.

New York City's Water Meter Specifications

Specifications for Water Meters. Twelve mimeographed pages issued by the Bureau of Water Supply of the Department of Water Supply, Gas and Electricity, City of New York. 1917. (Apply to Board of Water Supply, Gas and Electricity, Municipal Building, New York City.)

Chlorination and Filtration of Water.

The Michigan State Board of Health has devoted its Engineering Bulletins of March and July, 1917 (Nos. 9 and 10), to a consideration of "Water Filtration" and "Water Chlorination." (16 pp. 18 pp.) State Sanitary Engineer Edward D. Rich is author of Bulletin No. 9, and he collaborated with Earle E. Waterman in the preparation of the second. (For copies apply to the State Board of Health, Lansing, Mich.)

When is a Holiday Not a Holiday?

Primary Days and Election Days as Holidays. An Instance of Governmental Absurdity and Waste. Report prepared by the Chicago Bureau of Public Efficiency, November 5, 1917. 11 pp. (Apply to Harris S. Keeler, Director of the Bureau, 315 Plymouth Court, Chicago, Ill.)

War-Time Activities of American Cities.

Under the title, "American Cities During War Times," Dr. Clinton Rogers Woodruff, Secretary of the National Municipal League, presented his annual review of municipal affairs at the Twenty-third Annual Meeting of the League, November 21, 1917. A 13-page reprint of this address has been made, copies of which may be obtained from the League, North American Building, Philadelphia, Pa.)

War and the Chicago Plan.

Under this title, Walter D. Moody, Managing Director, Chicago Plan Commission, writes of the recent city-planning progress in his city, giving the status of the twenty-two "Plan of Chicago" projects. (Reprint from *The Fine Arts Journal*, November, 1917, issue.) 16 pp. Illustrated. (Apply to author, as above.)

A Manual for the War Work of All Churches.

The War-Time Tasks of Every Church and Community: A Practical Manual of Work for All Churches during the War. Prepared by the Committee on War-Time Local Inter-Church Work for the Congress on the Purpose and Methods of Inter-Church Work, Pittsburgh, Pa., October 1-4, 1917. 64 pp. (Apply to Rev. Roy B. Guild, Executive Secretary, Commission on Inter-Church Federations of the Federal Council of the Churches of Christ of America, 105 East Twenty-second Street, New York City.) 10 cents.

Supplementing the Food Supply.

Urban and Suburban Food Production: Its Past and Its Future. By Charles Lathrop Pack, President, National Emergency Food Garden Commission. A four-page resumé of the results of the movement for war-gardens. 1917. (Apply to Percival S. Ridsdale, Secretary of the Commission, 210-220 Maryland Building, Washington, D. C.)

Food Conservation Exhibits.

Graphic Exhibits on Food Conservation at Fairs and Expositions. 1917. Cartoons, photographs, diagrams. 52 pp. (Apply to the United States Food Administration, Washington, D. C.)

New York City Health Department Annual Report

Annual Report of the Department of Health of the City of New York for the Calendar Year 1916. 1917. 170 pp. Photographs, charts, statistical tables. (Apply to Department of Health, Center and Walker Streets, New York City.)

MOTT LAMP POSTS

STANDARDS OF MERIT

Special Designs of Lighting Standards For Type C Lamps

LAMP POSTS FOR ALL REQUIREMENTS

FOUNTAINS

Display and Drinking

For PUBLIC SQUARES, PARKS, PLAYGROUNDS, Etc.

ENTRANCE GATES, RAILINGS, SETEES

CATALOGUES ON APPLICATION

THE J. L. MOTT IRON WORKS

Fifth Avenue and 17th Street, New York

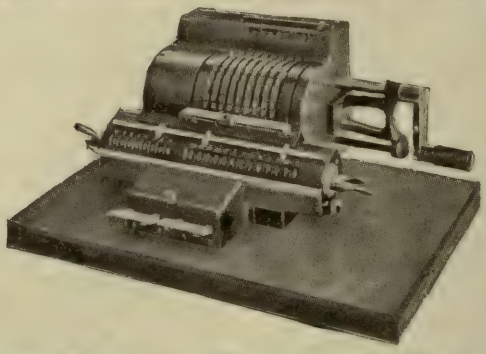
CITY OFFICERS

AUDITORS, CLERKS, ENGINEERS, SUPERINTENDENTS OF STREETS

Do away with waste of time and the possibilities of costly errors by using

Speed

Accuracy



Ease of

Operation

The New Pony Marchant Calculator

The Marchant is used throughout the United States in the following classes of claculation: Tax Etension, Decreasing or Increasing Valuations, Figuring Interest on Tax Delinquencie Apportioning Funds of Treasurer, Apportioning of School and Road Funds, Bond and Redemp tion Interest all Classes of Engineering Calculations and also for New and Old Bridge Wor Calculations. For further information write:

Marchant Calculating Machine Company

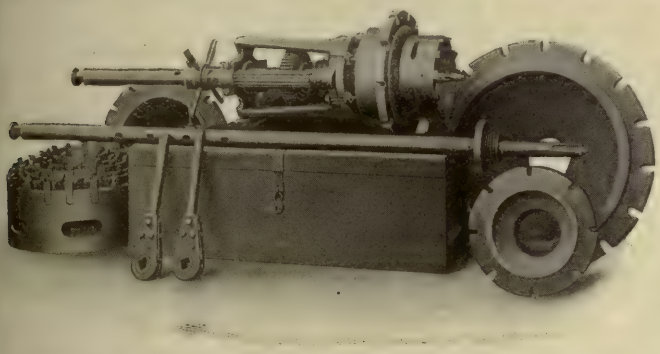
EMERYVILLE Fourth Street OAKLAND, CAL.

Methods, Materials and Appliances

News from Engineers, Manufacturers and Supply Houses

Japanese Government Places Large Order for Water-Works Supplies

Below is an illustration of a tapping machine sold to the Imperial Japanese Government. This is one of an order for a considerable number of these machines for making connections from ½-inch up to 24 inches, inclusive. The whole order is probably one of the largest for strictly water-works equipment ever sold to a foreign government. The company receiving this unusual order is the Water Works Equipment Company, 50 Church Street, New York City, manufacturers of water-works equipment of every description, and includes tapping sleeves and valves, rachet pipe cutters, pipe jointers, detectors, pipe locators, detectorphones, aquaphones and corporation cocks of all sizes.



TAPPING MACHINE SOLD TO THE IMPERIAL JAPANESE GOVERNMENT

Under the personal direction of Paul Lanham, engineer-in-charge of water surveys for leakage in Washington, D. C., the Water Works Equipment Company has organized a department to specialize in water waste investigations. The company's experts, using the Manograph, will determine and locate underground leakage, wasteful or excessive consumption, and the slip of meters or pumps. They will also report many other facts of value regarding the distribution system. Estimates and outlines of methods will be furnished on request.

New High Duty Engine for New York

On page 54 of this issue appears a picture of the Robinson high duty fire engine recently accepted for New York City. At one of the five official tests two 100-foot lines of 2½-inch hose were used, with reducing valve in one, siamesed into one 50-foot length of 3-inch hose with a 1¾-inch nozzle, and a discharge of 719.3 gallons per minute was obtained with an average net pump pressure of 138.2 pounds and a nozzle pressure of 62.6 pounds.

Six Western Governors Inspect the Columbia River Highway

The chief executives of six western states were guests of the White Company's Portland branch during a conference of governors in that city. In addition to discussions of important state matters, the governors made a tour of the Columbia River Highway in a White 16-valve-four, and were photographed at the foot of Multomah Falls. A reproduction of this view is shown on the front cover of the Town and County Edition of this issue.

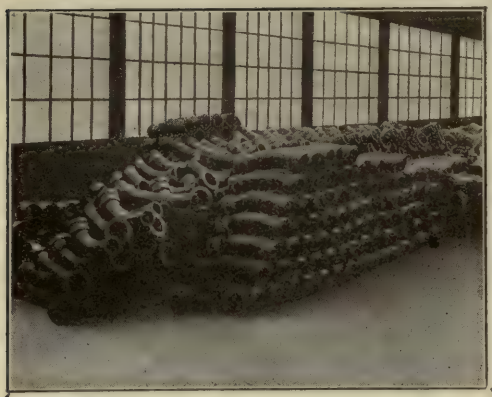
The states and governors represented were: Utah, Governor Bamberger; Oregon, Governor Withycombe; Washington, Governor Lister; Montana, Governor Stewart; Nevada, Governor Boyle, and Idaho, Governor Alexander.

Dallas, Texas, Using Auto Flushers

An Indiana auto flusher which is in use in Dallas, Tex., is shown on page 55 of this issue. This truck is made by the Indiana Truck Corporation, of Marion, Ind., which has recently received a large order from the U. S. Government for military trucks. Charles G. Barley, president of the corporation, has just returned from an extended trip in California and the Northwest, and reports excellent business.

Court Decision Favors Turbine Sewer Machine Company

In the last session of the United States District Court for the Eastern District of Wisconsin a notable decision was handed down in the case of the Turbine Sewer Machine Company vs. William J. Stevenson, relating to alleged infringements by the latter on the patents of the company. All seven points raised by the



A pile of bends in our foundry stock.

Need Fittings?

Large or Small--- Standard or Special

If standard, we have them —if special we will make them.

We are equipped to give you the best of service in specials and

CAST IRON PIPE

JAMES B. CLOW & SONS

Established 1876

534-546 So. Franklin Street, CHICAGO

Sales Offices

New York Detroit St. Louis San Francisco
Minneapolis Milwaukee Denver Los Angeles

Works

Chicago, Coshocton and Newcomerstown, Ohio

Physically Fit!

The Child of Today The Soldier of the Futur

We need sturdy Americans and need the badly. The selective draft law has reveal a large number of physical defects amo the men of this country. The promine underlying course of a large percentage rejections was given as "under development

Are we going to permit the youngsters to-day to grow up and be weaklings?

PLAYGROUNDS

Its up to every city and town to eq playgrounds and give the "kids" exerc and fun. Give them playgrounds in wh to romp and build up their growing lit bodies. Make your town a "Health Tow A sturdy body is usually free from sickn and other ailments. Install playgrou and reduce doctor bills.

Get in touch with us! We'll show y how to plan and equip a model playgrou *It's our business.*

Write for Illustrated Book

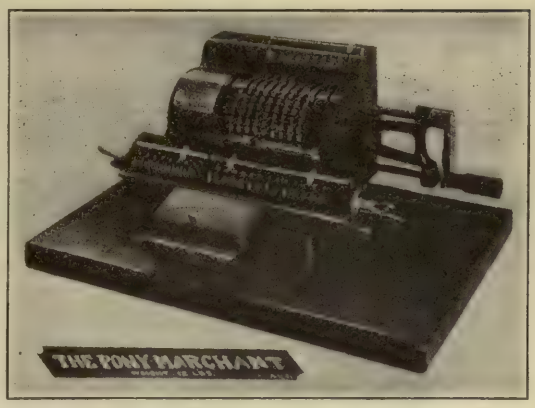
HOWARD GEORGE
Philadelphia, Pa.
"The Playground Outfitter"

omplainants were upheld by the court and lamages allowed. The points in order vere: (1) Letters patent No. 1,036,735 of he United States were granted to Philip A. Fuchs, William Hiecke, Jr., and Wiliam J. Stevenson for a device for cleanng sewers, on the 27th of August, 1912, nd are good and valid at law. (2) Letters patent No. 1,163,624 granted to the ame parties are also declared good and alid at law. (3) The complainant, The Turbine Sewer Machine Renovating Comany is the owner of the said letters atent, and is also the owner of the exlusive right to manufacture, sell and use ewer-cleaning devices embodying the inention covered by the letters patent. (4) nfringement of these letters patent has een perpetrated by the defendant, within he six years last past by making, using nd selling within the United States sewer leaning devices having therein deflectors and lades embodying the inventions described in he letters patent. (5) The defendant, William . Stevenson, and his agents, servants, and emloyes are perpetually restrained from making, sing or selling such devices by order of the ourt. (6) The complainants are given power o recover profits, gains and advantages deived by the defendant by reason of his inringements. (7) John F. Harper, as master f the Court, was appointed to determine the mount of profits, gains, etc., of the defendant. 8) The complainants recover cost and disursements for the suit instituted to recover hese damages for infringement.

✣ ✣

A Calculating Machine for Municipal Accounting

The photograph shown below is a scene in he City Controller's office of the city of Philadelphia, Pa. In the foreground is a gentleman who is using a Marchant calculating machine. This little instrument plays a big part in Philadelphia's financial administration. On it are figured the enormous and intricate pay rolls of the city. It saves time, labor and patience in handling and checking large contracts and small in many of the city's departments. It has proved of great value in figuring tax levies, as two tax rates can be extended on it at the same time. In fact, there is hardly any figuring work in which this machine will not be found of value for both its speed and its accuracy.



THE MARCHANT CALCULATING MACHINE

The illustration reproduced above will serve to give a good idea of the compact construction of the Marchant calculating machine, which should prove of interest to live municipal officials who are on the lookout for time-and-labor-saving devices for their departments.

CALCULATING MACHINE IN USE IN CITY CONTROLLER'S OFFICE IN PHILADELPHIA

✣ ✣

Farmer Needs Nation's Support in the Form of Good Roads

In line with his widely known activity in the interest of good roads, S. M. Williams, General Sales Manager of the Garford Motor Truck Company, of Lima, Ohio, calls the attention of the public to the necessity of the closest possible coöperation with the farmer in the latter's efforts to produce a yield sufficient to feed our fighting men abroad and those at home.

It is obvious, he declares, that thousands will be drawn from agricultural pursuits, such as cattle raising and the like, under the conscription system, and this in itself will prove a great strain on the farmers, who have been urged to do everything in their power to

METROPOLITAN BRICK
IN DECATUR, IND.

This street in Decatur, Ind., was paved with Metropolitan Brick in 1894—twenty-four years ago—nearly a quarter century of service and still in splendid condition. This street is no exception—because where ever Metropolitan Brick is used you will find a quality pavement—a dependable pavement.

METROPOLITAN

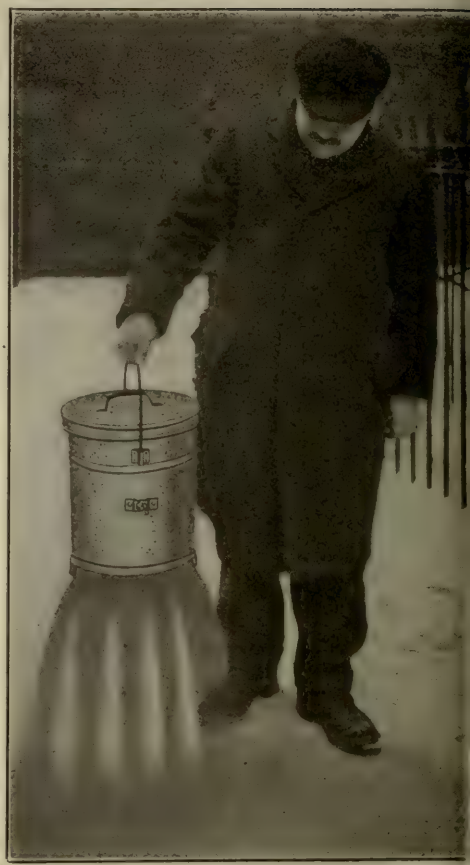
pavements are noted for their unusual long-life—ease of traction—and appearance.

Are you using Metropolitan Brick in your city—you know, its better to use it than to *wish* you had.

Get our free book "Shale Bed to Road Bed." It tells you WHY Metropolitan is THE brick.

Metropolitan Paving Brick Co.
Canton, Ohio

"The Best Paving Block Made"



Slippery Walks are a Menace to Life and Limb

Avoid accidents and litigation with the B. M. E. Junior Dry Sand Spreader

This little machine carries 23 pounds of dry sand which can be spread evenly and lightly, over an area 1,200 square feet. Wing nut adjustment regulates flow of sand.

Invaluable for sanding icy walks, approaches, steps, and unusual places where larger sanders are not practical.

Light, Strong, remarkably efficient

Price $5.00 each, net F. O. B. Buffalo, N. Y.

Order now for prompt delivery

Buffalo Municipal Equipment Company
Mutual Life Building, Buffalo, N. Y.

Sole Makers of B. M. E. Sand Driers and B. M. E. Patented Vehicle Sand Spreaders

make their lands yield the maximum return.

"But of equal importance is the matter of the transportation of foodstuffs from the farms to the markets," continues Mr. Williams. "What good will it do for the farmer to produce food supplies if they cannot be conveyed to market? Corn that stays in the farmers' cribs, as it was held for months last winter in many places in the corn belt, does nobody any good. Wheat that stays on the farms of Kansas, because it cannot be transported over wretched roads into the markets, helps only the rats.

"What is the sense of all the intricate transportation systems of the railroads if the feeders of those railroads, our public roads to shipping points, are neglected to such an extent that they cannot be used when the crops have been harvested?

"It so happens that a few misguided individuals argue that good roads are a luxury simply because their grandfather did not have them. They either do not know, or forget to mention, that our grandfathers did not have to feed 100,000,000 people in America alone, not to mention millions of our suffering allies. All our grandfathers had to do was to supply food for between 20,000,000 and 25,000,000.

"It is decidedly wrong and unpatriotic for us at this time to hamper the farmer, who is working from dawn to dusk to help win the war, by making him attempt to haul our food supplies over roads that are in no fit condition for any sort of travel.

An Adjustable Steel Snow Plow

In many states the law requires that property owners keep their sidewalks clear of snow, demanding that it be removed within twenty-four hours after it has fallen. In many municipalities public snow plows have performed this office in a more or less desultory fashion. Crudely formed, the product of local genius, their work has been necessarily slow and clumsy.

From this "mother idea," however, modern ingenuity has evolved a plow more adapted to meet the exacting demands of this day of efficiency. The illustration reproduced herewith shows the adjustable widths of a snow plow manufactured by the Russell Grader Manufacturing Company, Minneapolis, Minn. It has a minimum spread of four feet, with half-foot increases up to six feet. The adjustments are

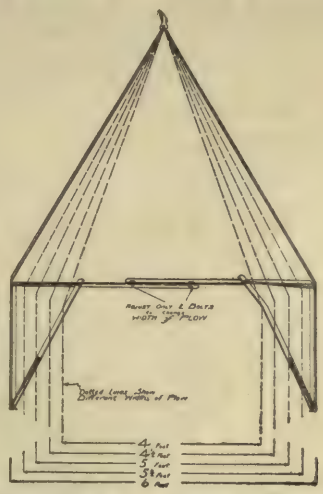
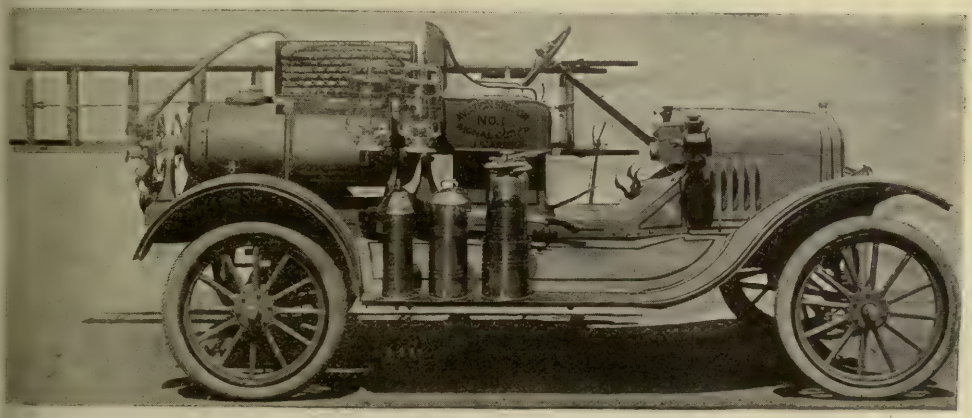


DIAGRAM SHOWING ADUSTABLE WIDTHS OF RUSSELL SNOW PLOW

made by two removable bolts or pins. The plow is hinged at the front and at both sides. A narrow, projecting rim along the base of the plow on either side insures efficient "close" scraping.

Signal Corps Fire Apparatus

The picture below shows the light, speedy type of fire apparatus sold by the American-La France Fire Engine Company, Inc., of Elmira, N. Y., to the U. S. Army for the Aviation Section of the Signal Corps. This apparatus was described in the December issue, but was incorrectly illustrated.



AMERICAN-LA FRANCE DOUBLE-TANK CHEMICAL ENGINE FOR THE AVIATION SECTION OF THE U. S. SIGNAL CORPS

MICHIGAN To THE FRONT for PLAYGROUNDS

In recognition of the necessity for playgrounds the following bill was passed by the Michigan Legislature during the 1917 session.

A BILL

Authorizing cities, villages, counties, townships and school districts to operate systems of public recreation and playgrounds.

The people of the State of Michigan enact:

Section 1. Any city, village, county or township may operate a system of public recreation and playgrounds; acquire, equip and maintain land, buildings or other recreational facilities; employ a superintendent of recreation and assistants; vote and expend funds for the operation of such system.

Section 2. Any school district may operate a system of public recration and playgrounds, may vote a tax to provide funds for operating same, and may exercise all other powers enumerated in Section 1.

Section 3. Any city, village, county, township or school district may operate such a system independently or they may co-operate in its conduct in any manner in which they may mutually agree; or they may delegate the operation of the system to a recreation board created by any or all of them, and appropriate money, voted for this purpose to such board.

Section 4. Any municipal corporation or board given charge of the recreation system is authorized to conduct its activities on (1) property under its custody and management; (2) other public property, under the custody of other municipal corporations or boards, with the consent of such corporations or boards; (3) private propety with the consent of the owners.

Lots of "Fun-Ful" Playground Apparatus is in use in Michigan. Much more will now be used.

Whether you live in Progressive Wide-awake Michigan or not, you will need "Fun-Ful" Equipment in your community. We have everything for the Playground.

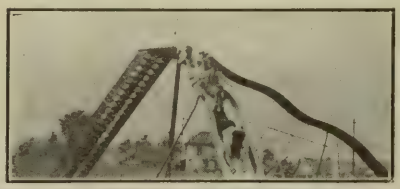
"Everything for the Playground"

THE FUN-FUL LINE
PLAYGROUND EQUIPMENT

Write for free catalog today

HILL-STANDARD CO.

216 Fun-Ful Ave. :: Anderson, Indiana



Loading and Dumping Combination

SPAULDING ROAD MACHINE FOR DIRT MOVING

A folder of interest to everyone who has any hauling, ditching, road-scraping or dirt-spreading to do has been issued by the Spaulding Manufacturing Company, Department 240, Grinnell, Ia. This folder, entitled "Spaulding 2-in-1 Road Machine," describes a tractor-or-horse-drawn machine which combines the advantages of a loading machine, dump wagon, road scraper and ditch digger. The construction features are brought out clearly by means of a large illustration on which the various parts are numbered to correspond with the numbers opposite the explanatory captions on either side. The company has received the following testimonial letter:

DES MOINES, IOWA,
October 11, 1917.

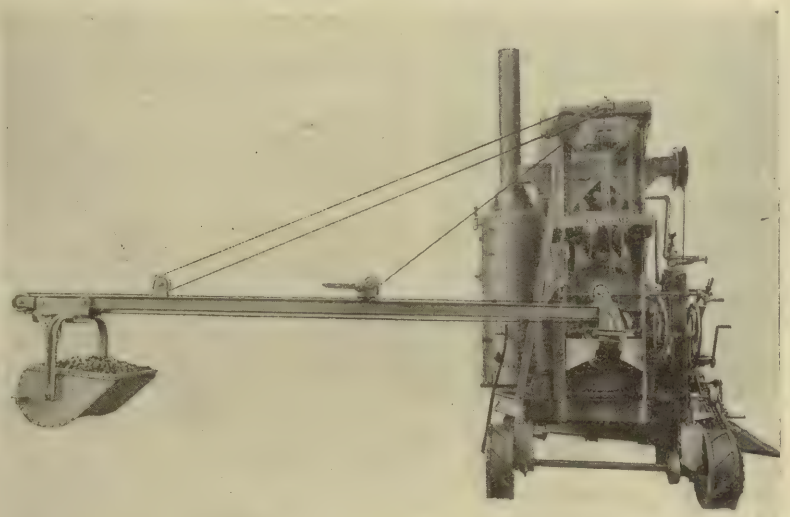
Spaulding Mfg. Co., Grinnell, Iowa:

Gentlemen—We are pleased to enclose our order to you for three of your grading machines.

This will be all we can use just now on account of the lateness of the season, but you will hear from us further in the spring.

We have found this machine to do the work cheaper than any machine we have ever had on our work, on account of its reducing hand labor in finishing so much. Your demonstrators reduced our cost almost sixty per cent, and we are very much pleased with the work they did.

Yours very truly,
JAMES HORRABIN & COMPANY,
By JAS. HORRABIN, President.



RANSOME BUCKET AND BOOM TYPE ROAD PAVER FOR HEAVY WORK

How to Make and How to Use Concrete

In offering the public a book under the above title, the Ransome Concrete Machinery Company, 115 Broadway, New York City, is making available a compilation of concrete construction data that will prove of real commercial value to contractors and public works officials. The author of this book is H. Colin Campbell, C. E., E. M., Director, Editorial Bureau of the Portland Cement Association. The company has subordinated its regular line of machinery and concreting equipment "to those fundamental practices which govern success in the use of concrete." In this 150-page book have been gathered useful data that are applicable to almost any kind of concrete work. Readers are referred in the introduction to the Portland Cement Association for additional valuable information, and a bibliography of the pamphlets issued by this association is submitted.

A good general idea of the contents of the book, which contains 152 pages, may be drawn from the summary of some of the topics covered quoted below:

Batch mixers; cement; character of work; consistency of mixtures; drainage; estimating; fills; forms; grading; joints; mixing; placing concrete; reinforcing concrete; roofs; storage requirements; transportation; weather conditions; weights and volumes, etc.

The last twenty pages are devoted to a presentation of some of the Ransome products, one of which is herewith illustrated.

MUNICIPAL SURVEYS

Twelve years successful results in over one hundred city, county and state governments in United States and Canada.

Audits
Charter Drafting
Budget Systems
Accounting
Salary Standardization

Police and Fire
Highways
Health
Institutions
Schools

Refuse Collection and Disposal
Waterworks and Other Public Utilities
Methods of Taxation, Etc.

Write for Literature. Estimates Furnished.

BUREAU OF MUNICIPAL RESEARCH, 261 Broadway, New York City

PENNSYLVANIA PORTLAND CEMENT

"One Source—One Mill—One Standard"

Every bag of Pennsylvania Cement, wherever obtained and for whatever purpose, has the same high quality required for government and public service work in which it is extensively used. Ask your dealer for Pennsylvania. If he cannot supply you, write direct to

Pennsylvania Cement Company, 30 East 42nd St., New York

City of Lapeer
R. F. FRAY, MAYOR

LAPEER, MICHIGAN, April 6t

South Bend Motor Car Works
South Bend, Ind.

Attention Messrs. Mecklenburg & Scott.
Gentlemen:

I am writing this letter to let you know that you were about 24 hours early with your Munsey Committee, as last night Lapeer experienced the most disastrous fire ever known in her history.

An alarm was turned in at 6.30P.M. and we put the pumper to work immediately, drawing from the river. She did continuou service for about 8 hours and saved the city of Lapeer at leas two valuable stores, amounting to a good many times the price of the entire equipment.

This morning our most radical knockers against the purcha of the machine frankly told me that the machine did not owe th city of Lapeer a cent.

It certainly did admirable and efficient service for 8 ho continuous work.

Very truly yours,

R. F. Fray
Mayor.

RFF/KB

—AND NOT ONLY IN LAPEER

but in every city where South Bend Double Duty Apparatus is installed. They perform that same efficient, conscientious service. They are dependable—and that's what counts in Fire Apparatus. Write us for booklets.

The South Bend Motor Car Works South Bend, Ind

The United States "Nobby Cord" Pneumatic Truck Tire

New Tire Factor Enters Field of Motor Trucks

Today it is a fact that many motor trucks if equipped with United States "Nobby" Cord Pneumatic Truck Tires can be operated at a greatly increased speed and with greatly reduced expense.

Some trucks can't use these "Nobby" Cord Pneumatic Truck Tires—but many can—can yours?

If yours can, you can save money on gasoline, oil and truck upkeep.

If yours can't, you can rely on the phenominal mileage records that have been made, and are being made, by United States Solid Truck Tires.

See the nearest United States Truck Tire Dealer or the nearest United States Tire Service Branch. The truck tire expert will tell you. If there is no dealer near you, write us, sending make of your truck and the capacity.

United States Tire Company

1790 Broadway, New York

THE GAMEWELL FIRE ALARM TELEGRAPH CO.

"Registered U. S. Patent Office"

Manufacturers of Fire Alarm and Police Signal TELEGRAPHS for Municipalities and Private Parties

The Gamewell system of to-day is the outcome of the combined inventive genius and mechanical skill of many whose valuable services the company has been able to secure during the past fifty-seven years, in pursuance of its policy of meeting at any cost the requirements of the varied conditions existing in different localities.

Correspondence Solicited.

General Office and Works:
Newton Upper Falls, Mass.

Have You Brains?

What are they worth to you?

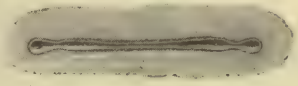
"What is the service worth" is the basis for all values.

SERVICE

is **all** that is bought or sold. This is why two loaves of bread same size are worth more than one. Why a R. R. ticket from New York to Chicago is worth more than one to Buffalo.

Additional Service

This is why B-Lateral Fire Hose is worth more than DOUBLE that of the old construction, because Bi-Lateral Hose can be flattened without injury to the rubber lining.



Why not buy fire hose constructed right? When in the market write us,

BI-LATERAL FIRE HOSE COMPANY
326 W. Madison Street, Chicago, Ill.

DUPLEX

4-WHEEL DRIVE TRUCK

The Duplex has the strength, the irresistible power and endurance to perform efficiently the most severe haulage tasks.

Let us send you our catalog and the heavy haulers magazine, "Duplex Doings." Address all communications to Dept. 136.

DUPLEX TRUCK COMPANY
Lansing, Michigan

Dayton Airless Fire Equipment Tires

are safe and easy-riding at any

SPEED

They are always reliable and long service makes them economical. That's why they dominate the field in motorized fire equipment.

Write for booklet.

The Dayton Rubber Mfg. Co.
DAYTON, O., U. S. A.

The Anderson Coupling & Fire Supply Company

KANSAS CITY, KANSAS

Manufacturers of

MOTOR FIRE APPARATUS

General Fire Department Supplies

Anderson-Hale Fire Station Door Openers

Estimates Cheerfully Given

Loper Fire Alarm Co.

STONINGTON, CONN.

Manufacturers of

Compressed Air Fire Whistles

Whistle Blowers

Bell Strikers, Boxes, Gongs

Etc., Etc.

Estimates Cheerfully Given

A Fire Hose

of unusually careful manufacture

Wax and Para Gum Treated

The lining is of fine Para Gum, hand made, four calendered, smooth bore or lap-jointed.

Circular balance woven, each strand of cotton is treated to a bath of melted Wax and Para Gum, then cabled and woven into the jackets.

Absolutely waterproof, making the ideal hose for fire departments.

Treatment lubricates and solidifies the strands of cotton, assuring long wear.

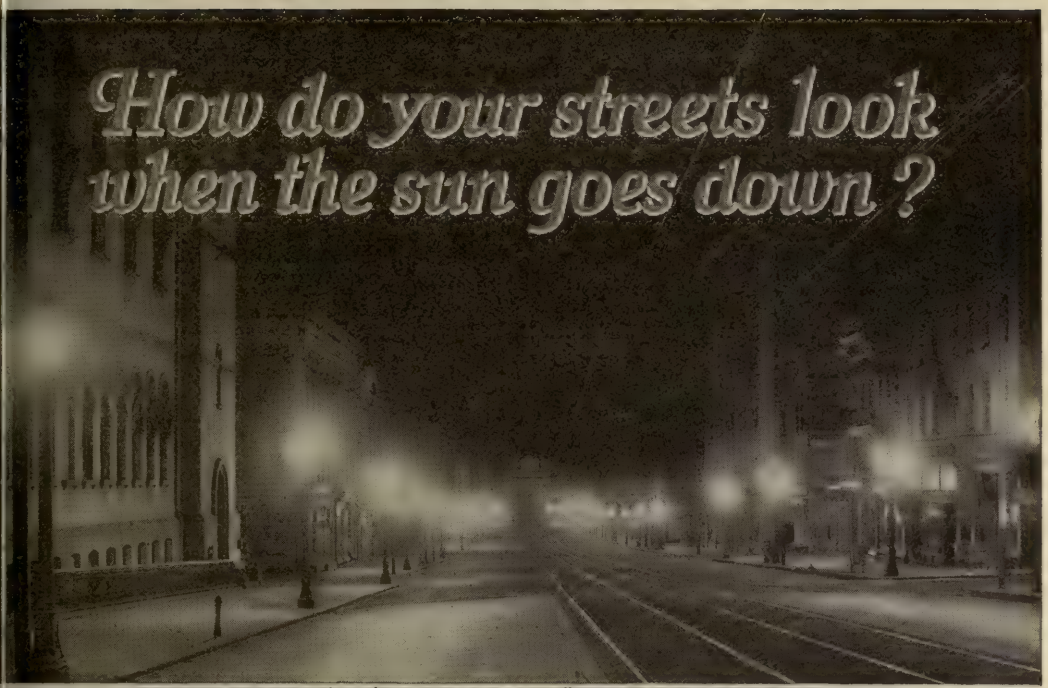
Made in all sizes from 1 to 6 inches inside diameter

Fabric Fire Hose Co.
Corner Duane and Church Streets, New York

BRANCH OFFICES:

CHICAGO	ELMIRA, N. Y.
ATLANTA	BINGHAMTON, N. Y.
COLUMBUS, O.	PITTSBURGH
MINNEAPOLIS	NEWARK, N. J.
OKLAHOMA CITY	MONTREAL
PORTLAND, ORE.	PROVIDENCE
SAN FRANCISCO	DALLAS, TEX.
BALTIMORE, MD.	

Patentee and Sole Manufacturer



Street-ology

Do they sparkle with white light?

Do they draw people from far and near to go "window shopping?"

Are they an inducement to live and do business in your city?

Do they increase the value of your real estate?

Do they advertise the city?

Do they discourage crime and rowdyism? Do they safeguard traffic and pedestrians?

Are they a credit to your city administration?

Are they a shining example of what a good lighting company can do for a city? Do they cause you to hold up your head in honest pride?

If you live in a G-E Lighted Town, you can give an emphatic "YES" to every question.

If you can't say "yes"—ask the nearest G-E Street Lighting Engineers to help you make those dark highways into bright "*White Ways*."

GENERAL ELECTRIC COMPANY

SCHENECTADY, N. Y. Sales Offices in Principal Cities

7328

ALL MUNICIPALITIES NEED PLAYGROUNDS

The Playground not only betters the physical and moral tone of a city, but it is a real live investment. It cuts the perpetual moving population to a minimum which saves your manufacturer and your merchant.

American Apparatus will produce results.

WRITE FOR OUR CATALOGUE TO-DAY

AMERICAN PLAYGROUND DEVICE CO., W. 25th St., Anderson, Ind.

All Steel Playground Apparatus

THE EUREKA STUDEBAKER PARK COMBINATION

THE EUREKA LINE

Swings, Giant Strides Flying and Travelin Rings, Teeter Boards an Ladders, Aluminum an Maple Slides, Park Settee and Lawn Swings, Merry Go-Rounds, Horizonta Ladders and Combina tions.

Cat. No. 16 Full Outfit And Fittings Only

The Ashland Mfg. Compan
Dept. 14 Ashland, Ohi

To so form the life of our youth that they need never be reformed is indeed a great achievement

Eureka Equipment Utility Unexcelled Renowned Rectitude Efficient Economical Kiddies Kind All-Steel Apparatu

FOUNTAINS

DISPLAY and DRINKING

LAMP STANDARDS

OVER ONE THOUSAND PATTERNS

THE CASEY HEDGES CO.

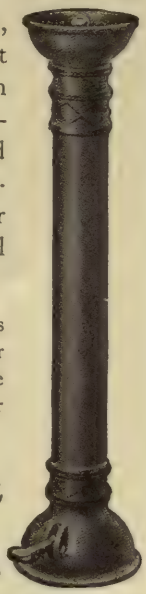
CHATTANOOGA, TENN.

Chicago Cincinnati

INEXPENSIVE DRINKING FOUNTAINS

Our bubbling fountains, the practical kind, are just the kind to be installed on your streets and boulevards, in your parks and squares and public playgrounds. The expense for installation is very small as is the upkeep cost.

We are specialists on fountains for drinking purposes. Place your requirements in our hands. Write for our catalogue showing our many designs.



RUNDLE-SPENCE MFG. CO.

Milwaukee, Wis.

ENTERPRISE IRON FENCES

Combine durability and handsome appearance.
They do not obstruct your fine views.
Let us blue-print your fence needs free.

Send for book containing reproductions of the finest fences — its free

THE ENTERPRISE IRON WORKS

1123 East 24th Street, Indianapolis, Ind.

The WHITE TRUCK BOOK

250 Pages *1400 Illustrations*

A Graphic Record of Truck Uses in all Lines of Industry and Commerce

Sent gratis to any truck user if request is signed by responsible official

THE WHITE COMPANY

CLEVELAND

RUSSELL SNOW PLOW

Adjustable and All-Steel

Delivered at any railroad station, freight paid

at $39.75

Adjustable widths: 4 ft., 4½ ft., 5 ft., 5½ ft. and 6 ft. adjustments made by two bolts (or pins) hinged at front and on both sides; rigid and strong; hard wood handles.

This is the latest of our Line of Road Working and Earth Handling Machinery. Send for Catalog.

Russell Grader Mfg. Co. - MINNEAPOLIS - MINNESOTA

Representatives in Principal Cities

Cemcoat

The Enamel-like Wall Coating

Cemcoat is furnished in either Gloss or Flat.
Cemcoat has the combined virtues of enamel and paint.
It presents a tile-like finish.
It is washable, sanitary and durable.
Cemcoat should be used for all municipal buildings such as Schools, Bath Houses, Police Stations, Jails, etc.
Particularly adapted for safety lines on pavements.

Write for literature, color card, testimonials, etc.

Department 27

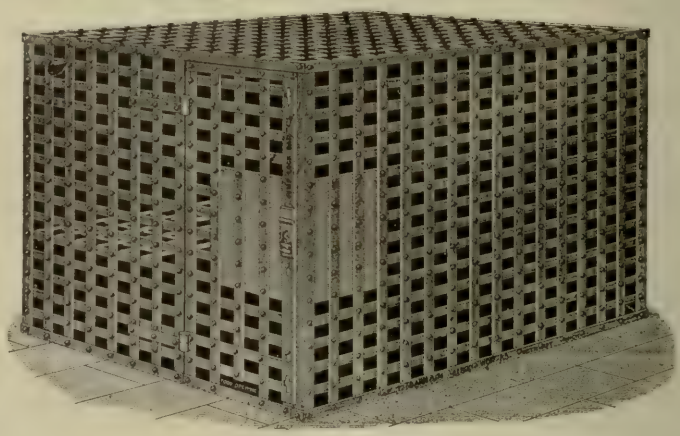
L. SONNEBORN SONS, Inc.
264 Pearl Street, New York

ESTABLISHED 1866

BARNUM JAIL CELLS

JAIL WORK of EVERY DESCRIPTION

Jail Entrance Doors
Steel Lining for Jail Walls
Jail Bedsteads
Steel Window Guards
Iron Stairs



Folding Steel Bunks
Tool-Proof Steel Work
Sanitary Equipment
Locking Devices
Padded Cells

SEND FOR CATALOGUE

E. T. BARNUM IRON WORKS
DETROIT, MICHIGAN

LAPIDOLITH

TRADE MARK

For All Concrete Floors

The concrete floors in your water-works, fire-houses, filtration plants, pump stations, etc. need Lapidolith to make them hard as granite—dustproof, waterproof and resistant to the action of most chemicals. Lapidolith should be used on all concrete floors, old or new. Results are guaranteed.

Used by leading industrial plants in every line in every city.

Write for literature, testimonials and free samples.

Department 27

L. SONNEBORN SONS, Inc.

264 Pearl Street, New York

The National Municipal League Series of Books

Edited by Clinton Rogers Woodruff

CITY GOVERNMENT BY COMMISSION. By Clinton Rogers Woodruff. The arguments for and against commission government and a description of the system.

THE CITY MANAGER. By Harry Aubrey Toulmin, Jr. A complete summary of the actual workings of the city manager.

MUNICIPAL FUNCTIONS. By Herman G. James. The standards of accomplishment by which a city government may be measured.

THE REGULATION OF MUNICIPAL UTILITIES. Edited by Clyde Lyndon King. A thorough discussion of the subject, with practical suggestions.

THE INITIATIVE, REFERENDUM AND RECALL. Edited by William Bennett Munro. 14 chapters by 14 prominent statesmen, educators, etc.

EXCESS CONDEMNATION. By R. E. Cushman. The benefit to city and citizens of condemning property adjacent to that actually needed.

CITY PLANNING. Edited by John Nolen. The solution to practically every building or reconstruction problem that confronts a city.

TOWN PLANNING FOR SMALL COMMUNITIES. By Charles S. Bird, Jr. Full of suggestions for those responsible for planning or improving small communities.

SATELLITE CITIES. By Graham Romeyn Taylor. How to plan the social and civic conditions of working people in industrial towns.

THE SOCIAL CENTER. By Edward J. Ward. Using the school-house for community purposes.

LOWER LIVING COSTS IN CITIES. By Clyde Lyndon King. A plan for reducing living costs in cities.

WOMAN'S WORK IN MUNICIPALTIES. By Mary Ritter Beard. An amazing summary of what women have done for their cities.

These books are bound uniformly in green cloth, stamped with gold. Price, $2.00 net per volume; by mail, $2.15. They can be purchased at book-stores or will be sent direct by the publishers. A descriptive booklet will be mailed free upon request.

THESE ARE APPLETON BOOKS

D. APPLETON & COMPANY 35 WEST 32ND STREET NEW YORK

A CITY THAT IS READY TO PLAY ITS PART IN THE STRUGGLE FOR DEMOCRACY

1918 holds definite promise of many and unusual demands on every city in this nation. Our success in winning this war is going to depend very largely on the success of each community in meeting these demands.

¶The strength of a community—its ability to get things done—depends mainly on the strength of its leadership.

¶A Chamber of Commerce is simply a name for a city's organized leadership. A city with a well organized Chamber of Commerce has much the same advantage over a city without one that a regiment has over a mob.

¶The city of Bethlehem, Pa., has marshalled its forces through the organization of the Greater Bethlehem Association. A remarkably successful campaign—completed the second week in December—has given this body 2200 members on the basis of $25 dues.

¶The men of Bethlehem are now prepared to face 1918 with confidence in their ability to play their part in the Nation.

¶The Bethlehem campaign was conducted under the guidance of the American City Bureau. There is time for a campaign of the same sort in your city in January.

¶The same services that achieved success in Bethlehem would achieve success in your city.

Why not, at least, ask us to tell you more about these services?

THE AMERICAN CITY BUREAU

TRIBUNE BUILDING **NEW YORK**

FIBREX TREE WIRE

FIBREX TREE WIRE is a rubber insulated, copper conductor, protected by a serving of tarred jute, one non-metallic tape and a weatherproof braid such as is applied to Simplex Wires and Cables for out-door service. The total thickness of this protection is about 5-32″.

FIBREX TREE WIRE is distinguished by a treated fibrous tape which is exceedingly tough and resists wear far better than any non-metallic protection previously applied to tree wires. This tape is applied in the same manner as steel tape and does not interfere with the flexibility of the insulated wire. It has the advantages of steel tape without its disadvantages.

FIBREX TREE WIRE is absolutely non-inductive. It is not a menace to workmen on or near the lines, because the fibrous tape can carry no dynamic or static charge.

FIBREX TREE WIRE will often save the expense of tree trimming. Tree insulators or battens are unnecessary.

FIBREX TREE WIRE is less expensive than some of the protective devices ordinarily used. It can be jointed to the line wire easily and safely.

FIBREX TREE WIRE is weatherproof. Regardless of weather conditions, grounds do not occur with their consequent dangers. There is no leakage over the fibrous tape and a uniform line voltage is preserved.

FIBREX TREE WIRE is made for all commercial voltages.

Ask for Sample and Prices.

SIMPLEX WIRE & CABLE Co

MANUFACTURERS

201 DEVONSHIRE ST. BOSTON

CHICAGO SAN FRANCISCO

SANITATION

While our "CANCO" garbage can in point of appearance and strength of construction is without a peer, yet our equipment—the most comprehensive in the country—is such that we can make any desired sort of garbage container.

TRADE CANCO MARK

AMERICAN CAN COMPANY

NEW YORK

Chicago Toledo San Francisco

With Offices in All Large Cities

REFUSE GOES INTO THE CAN— NOT INTO THE STREET

Why doesn't your city place Rochester cans on the street corners, in the parks and in all other convenient places. Rochester cans do away with unsightly littered streets. All rubbish goes into the cans — not into the gutters.

Made of the best materials and in many styles. Made by the makers of the famous "Iron Horse Brand" ash, garbage, street and trash cans.

Reasonable prices. Immediate shipments.

Send for illustrated catalog.

ROCHESTER CAN CO.
ROCHESTER, N. Y.

OWER SPRAYING

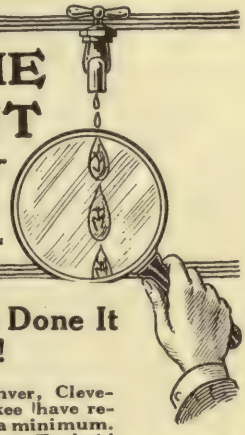
For your parks, streets and cemeies—you can do no better than to rchase Fitzhenry-Guptill Spraying chinery. The initial cost is low, ge economies are effected and pert satisfaction is derived from the of these sprayers.

And because of the many improvents and distinctive features, they being used all over the country.

end for valuable information on ee protection and insurance by ans of the right kind of spraying ipment."

TZHENRY-GUPTILL CO.
First Street Cambridge, Mass.

TAKE THE GERM OUT OF EVERY DROP . . . .



Other Cities Have Done It —You Can Do It!

Cities like Philadelphia, Denver, Cleveland, St. Louis and Milwaukee have reduced water-borne disease to a minimum. They have practically wiped out Typhoid Fever by the simple application of

Liquid EBG Chlorine

Make your drinking water safe, by applying Liquid Chlorine. It only cost 2 cents a year per capita. It's the cheapest health insurance you can buy.

Write for free book "The Wise Cities."

ELECTRO BLEACHING GAS CO.
16 East 41st Street New York City

Thorburn's

1917 Catalog

A very large volume of Thorburn Seeds are furnished for parks and cemeteries.

Write us for catalog and let us know your requirements: and your letter will have our prompt and careful attention.

J. M. Thorburn & Co.
53 Barclay Street NEW YORK

MEEHA
Nursery Stock
Needs no recommendation. It is k
throughout the American Contine
225 acres
ORNAMENTAL TREES, SHRU
EVERGREENS and HARDY PLA
Spring catalog now ready
THOMAS B. MEEHAN
Wholesale Nurseryman
DRESHER (Near Philadelphia) PA

Burpee's Seeds Grow

BURPEE'S ANNUAL for 1918, the Leading American Seed Catalog contains the latest and most re information about "The Best Seeds that Grow." 216 pages with 103 colored illustrations. It i free to those who write for it. Write for your copy today. A post card will do.
W. ATLEE BURPEE & CO. Seed Growers PHILADELP

Nurserymen, Florists and Seedsmen
Everything for Parks, Cemeteries and Private Places. Largest general assortment in America. Personal inspection invited. Special prices on car load lots. Switch from New York Central Ry. to our grounds. 1200 acres. Pleased to quote on your want list.
THE STORRS & HARRISON CO.
Landscape Dept.
627 Engineers Bldg.,
Cleveland, Ohio
Painesville,
Ohio

YOU WANT

BERCKMANS' TREES AND SHRUBS

For Park, Street and Landscape Planting

We offer a large variety of hardy ornamental trees, plants, shrubs, roses, etc. Largest stock of broad-leaved evergreens in the South.

WRITE FOR PRICES

P. J. BERCKMANS COMPANY, INC.

Box 1070-L. Augusta, Ga.

Hill's Evergreens

For Park, Boulevard and Landscape Planting

Perfect specimens in large as well as small sizes supplied.

Write for prices.—Mention this magazine.

The D. Hill Nursery Co., Inc.

Box 406. Dundee, Ill.

Dreer Specialties

Decorative Plants, Roses, Hardy Perennials, Hardy Shrubs, Hardy Climbers, Box Woods and Bay Trees, Hedge Plants, Aquatics, etc. We are large producers of above and many other plants suitable for Park use.

Write for Catalogue.

HENRY A. DREER, Philadelphia, Pa.

Ornamental Trees, Shrubs, and Hardy Perennials

A complete stock.
Quality unexcelled.
Send for price list.

HENRY KOHANKIE & SON
Painesville, Ohio

Framingham Nurseries

Ornamental trees, shrubs and evergreens for street and park planting.

FRAMINGHAM — MASS.

Lewis & Valentine Co.
Roslyn, N. Y.
The World's Largest Movers of Big Trees.

Willadean Nurseries

Offer a very complete line of Trees, Shrubs and Ornamental stock for all kinds of Landscape work. Send your want lists for estimate. Trade list on application.

THE DONALDSON CO.
Box 22, SPARTA, KY.

WAGNER NURSERIES

Are growing in fame for the vigor and completeness of their stock and the careful expert packing for shipment. We specialize in growing the choicest nursery stock for artistic landscape effects.

THE WAGNER PARK NURSERY CO.

Nurserymen *Landscape Gardeners*

(Box A) Sidney, Ohio

BOBBINK & ATKINS

World's Choicest Nursery and Greenhouse Products

We invite interested parties to visit our Nursery and inspect our Trees, Shrubs, Evergreens, Herbaceous Plants, Roses and other stock of which we have more than 300 acres.

OUR ILLUSTRATED GENERAL CATALOG No. 22 describes the high class Nursery material we grow.

SPECIAL PRICES quoted on lists for Public Parks.

Nurserymen, Florists and Planters, Rutherford, New Jersey

W. & T. SMITH COMPANY

NURSERY STOCK AT WHOLESALE

Send for Catalogue and Price List

GENEVA NURSERY, Geneva, N. Y.

SIGNS

Street Names, Catalog B

Road Direction, Park, Warning — Catalog C

Traffic, Catalog D

1918 Catalogs ready illustrated in colors
Send for ones that interest you

Joseph N. Early

Est. 1861

Patentee and Manufacturer

SIGNS ON SEPARATE POSTS

320 Broadway New York, N. Y.

Each Sign Plate protecte
an *"Early Patented Malle
Iron Frame."*

Absolute Protection

Ornamental and Dural

For Progressive Counti
Cities, etc., etc.

Guaranteed

WOOD BLOCK PAVEMENTS

Any paving contractor is entirely safe in giving you a guarantee on wood block pavements when the blocks are properly treated with **Reilly's Improved (Permanent) Creosote Oil—Patented.**

Containing at least three times as much permanent properties as other creosote oils, it effectually prevents the entrance of water and decay. Pavements cannot possibly bleed or bulge.

PLANTS—Indianapolis, Minneapolis, Seattle, Mobile

Republic Creosoting

Indianapolis Ind.

OILERS and FLUSHERS

"WORLEY-LOGAN"

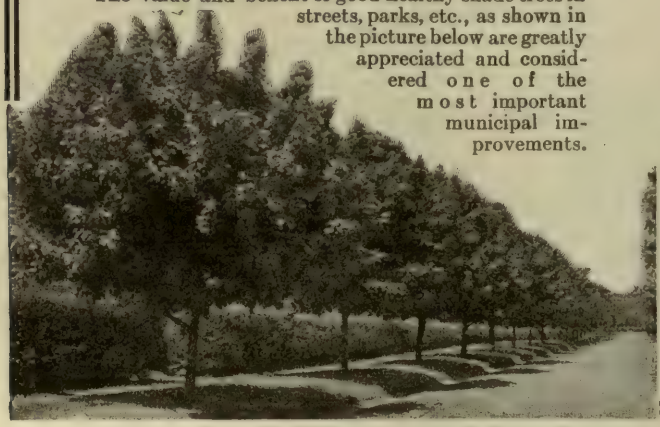
THE GOOD ROADS CO. KANSAS CITY, MO

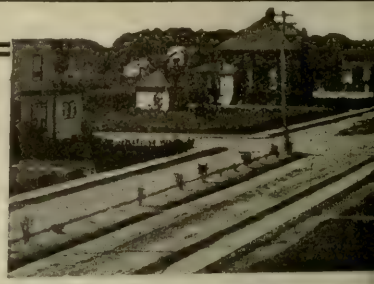
Shade Delivered With The Trees

3 to 5 years or more according to size saved over small saplings. We take the risk during their early tender life and you get the benefit.

We guarantee good trees of substantial growth and will replace any one that fails to thrive. We could not afford to make this offer if we did not know the good roots of trees that we furnish.

The value and benefit of good healthy shade trees in streets, parks, etc., as shown in the picture below are greatly appreciated and considered one of the most important municipal improvements.





Don't leave your streets barren and uninviting like the above. With a small outlay of money make your city attractive and a desirable place to live in.

Write today for literature on the subject.

Remember Hick's Trees are tall, straight and bushy and our 65 years in the business is a guarantee of quality.

HICKS NURSERIES

Westbury Long Island

FOR *SAFE* TREE SURGERY—

for Tree Surgery that is scientifically accurate and mechanically perfect—for Tree Surgery that saves trees without guessing and experimenting—come to headquarters.

The Davey Tree Expert Co., Elm St., Kent, Ohio

Branch offices with telephone connections: 225 Fifth Ave., New York. 2017 Land Title Bldg., Philadelphia. 450 McCormick Bldg., Chicago.

Permanent representatives in all principal cities.

Davey Tree Surgeons

"A BETTER LAWN"

This little book tells how to have a perfect lawn. It describes in detail the

FULLER & JOHNSON MOTOR LAWN MOWER

which combines flexibility with capacity and eliminates the "push." Designed for Parks, Cemeteries and Private Estates. Write for this book.

MANUFACTURERS DISTRIBUTING CO.
469 FULLERTON BLDG. ST. LOUIS, MO.

A SWING FOR PLAYGROUNDS

made strong and durable with heavy steel springs which makes swinging a pleasure as well as exercise for the children. Write for booklet.

NOLL BROTHERS
Benches and Swings
BAUSMAN, PA.

Unseen Service

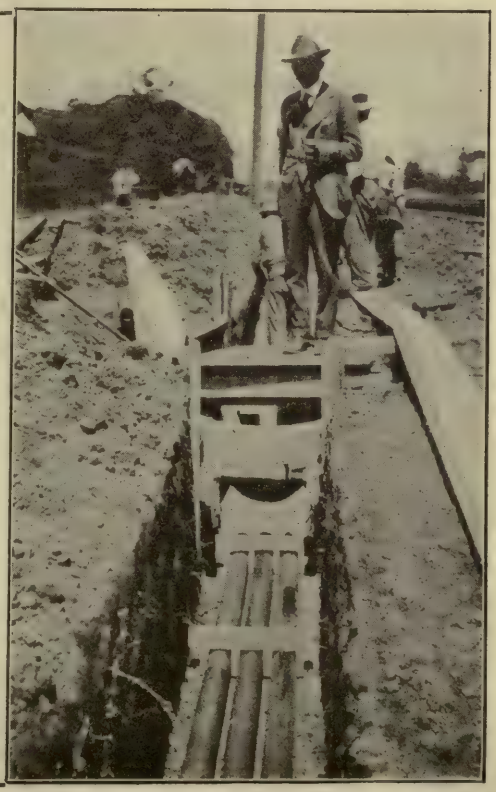
We appreciate the service to society of utilities that are visible—things like automobiles, trolley cars, etc., etc. But how many think of the infinite mileage of underground piping upon the service of which we all are so dependent? Under the streets of many up-to-date cities ORANGEBURG Fibre Conduit performs its faithful, unseen service—unthought of by the public at large, but fully appreciated by the companies whose wires and cables it protects.

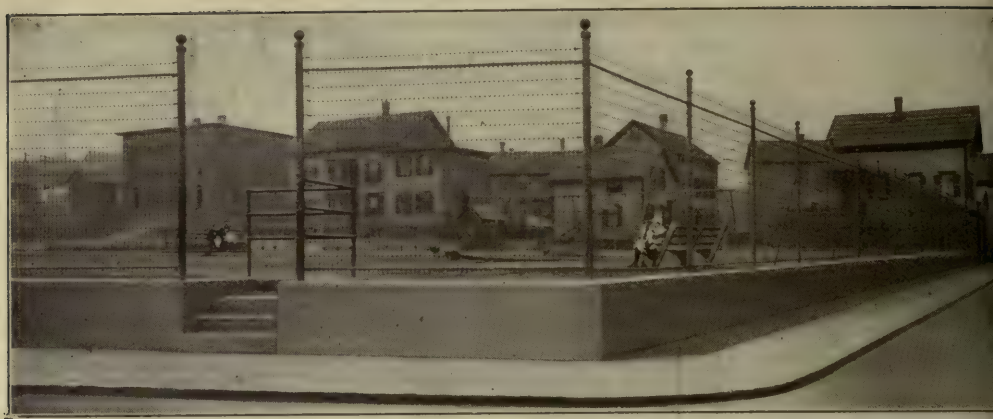
The *quality* of this service is the explanation of the great *quantity* of ORANGEBURG *Fibre Conduit* now in use.

BOOK D

THE FIBRE CONDUIT COMPANY
ORANGEBURG, N. Y.

New York Boston Chicago San Francisco





FENCE THE PLAYGROUNDS, PARKS AND RECREATION CENTERS *NOW.*

Playgrounds should be enclosed with a substantial fence shield the children from intrusion.

"EXCELSIOR" TRADE MARK RUST PROOF

Fences for School playgrounds a n public places me all requirements

They are made of large wires held at every intersection by our patented steel clamp, and made Rust Pr by galvanizing AFTER MAKING with a heavy coating of pure hot zinc.
For beautifying public grounds and flower beds use Excelsior Rust Proof Flower Guards, Tree Guards, Arch and Trellises. Write for illustrated Catalog G.

WRIGHT WIRE COMPANY, Worcester, Mass.

AMERICAN-GROWN TREES

Shrubs and Plants

OUR ability to supply trees, shrubs and plants of the highest quality is not curtailed by the stoppage of foreign shipments. Buy nursery stock grown at Andorra.

Andorra Nurseries
Wm. Warner Harper, Prop.

Box 20
Chestnut Hill
Phila., Penna.

Our catalog, "Suggestions for Effective Planting." on request.

A STREET CAN

convenient for hurried City people. T Hood cover hides the contents from passe by—the open ends allow papers, etc., to easily and quickly deposited.

This Can may be used with sacks hung side. Is made in set up or knock down sha

For complete description, ask

THE STEEL BASKET COMPAN 708 So. Third St., Cedar Rapids, Io

Expert Advice is a Real Economy

DIRECTORY OF CONSULTING ENGINEERS CONTRACTORS LANDSCAPE ARCHITECTS

Effective Construction Requires Wise Planning

bright & Mebus
CIVIL ENGINEERS
ns planning and municipal improve-, parks, drainage, sewerage and disposal.
98 LAND TITLE BUILDING
PHILADELPHIA

KANSAS CITY, MO. Interstate Bldg.
Burns & McDonnell
CONSULTING ENGINEERS
Appraisals, Rate Investigations, Expert Testimony, Water Works, Sewerage, Lighting.
Clinton S. Burns R. E. McDonnell

The Duluth Engineering Co.
W. B. PATTON, Mem. Am. Soc. C. E., Ex-City Engineer Duluth, Manager
MUNICIPAL ENGINEERS
Waterworks, Sewerage, Electric Lighting, Town Planning.
Suite 612-616 Palladio Building
DULUTH, MINN.

hn W. Alvord and Chas. B. Burdick
ONSULTING ENGINEERS
ports, Investigations, Plans and fications for Water Supplies, r Purification, Water Power, rage, Sewage Disposal.
TFORD BLDG. CHICAGO

PARK AND CIVIC DESIGN
GEORGE BURNAP
WASHINGTON, D. C.
Author of
PARKS: Their Design, Equipment and Use

F. A. Dunham-Clarin Co.
CIVIL ENGINEERS
Municipal Engineering
Roads Sewers Supervision
Surveys
Topographic Title
Land Subdivisions
109 Park Ave. Tel. 610
PLAINFIELD, N. J.

EFFIELD A. ARNOLD
Landscape Architect
Land Subdivisions
Parks Institution Grounds
Private Estates
romfield St. Boston, Mass.

JAMES M. CAIRD
Assoc. Am. Soc. C. E.
CHEMIST and BACTERIOLOGIST
OFFICE AND LABORATORY
271 RIVER STREET TROY, N. Y.
Water Analysis and Tests of Filter Plants

Analyses Tests Inspections
Consultations Reports Specifications
WALTER H. FLOOD
Chemical Engineer
PAVING AND ENGINEERING MATERIALS
Municipal Work a Specialty
326 River Street, CHICAGO

NOLD & TRIPP
Landscape Architects
Planning, Land Subdivisions, Parks, Institution Grounds, Private Estates
rdian Bldg., Cleveland, Ohio

CHESTER & FLEMING
HYDRAULIC AND SANITARY ENGINEERS
Water Works, Water Filtration, Appraisements and Reports, Sewerage, Sewage Disposal, Operation of Properties.
UNION BANK BLDG. Pittsburgh

Fuller & McClintock
CONSULTING HYDRAULIC ENGINEERS and SANITARY EXPERTS
170 Broadway, New York City
George W. Fuller James R. McClintock
Jesse K. Giesey

ASSOCIATED DUSTRIAL SERVICE
West 37th St., New York City
ustrial Surveys
and Development Plans

LOUIS S. COLE
LANDSCAPE ARCHITECT
14 E. Jackson Blvd.
CHICAGO, ILL.
Specialist in City Planning, Playgrounds, Parks and Cemeteries.

Gannett, Seelye & Fleming
CONSULTING ENGINEERS
Civil, Hydraulic, Sanitary, Electrical, Municipal Problems
204 LOCUST ST., HARRISBURG, PA.

as City, Mo. Interstate Bldg.
ACK & VEATCH
Consulting Engineers
age, Sewage Disposal, Water Sup-Water Purification, Electric Lighting, Plants, Valuations, Special Investi-ns and Reports.

J. R. CRAVATH
Consulting Engineer
140 S. Dearborn St., Chicago
Street lighting.
Public utility rates and valuations.
Supervision of operation of electric plants.

SAMUEL A. GREELEY
64 W. Randolph St., Chicago
Hydraulic and Sanitary Engineer
Sewerage, Sewage Disposal, Water Supply and Filtration, Garbage and Refuse Disposal, Treatment of Industrial Waste, Supervision of Operation.

H. BLANCHARD
m. Soc. C. E. M. Can. Soc. C. E.
ONSULTING HIGHWAY ENGINEER
OADWAY and 117th STREET
NEW YORK CITY

WILLIAM E. CULLEN
Landscape Architect and Designer
Ornamental Gardening, Beautifying Homes, Rural Districts, Towns, Schools, Yards, Parks and Cemeteries.
BOULDER, COLORADO

JOHN H. GREGORY
Consulting Hydraulic Engineer and Sanitary Expert
170 Broadway, New York City
Reports, Investigations, Plans and Specifications for Sewerage, Sewage Disposal, Water Supply, Water Purification and Garbage and Refuse Disposal.

James C. Harding,
Consulting Engineer and Sanitary Expert.
Water Supply and Purification. Refuse Disposal. Sewerage and Sewage Disposal. Investigations of Epidemics. Water Works Valuations. Supervision of Construction and Operation.
New York City, 170 Broadway

GEORGE S. IREDELL
Landscape Architect & Municipal Engineer
904 Littlefield Bldg., Austin, Texas
Parks, Cemeteries, City Additions and City Planning, Beautification of Streets, Public Grounds, Estates, etc. Designs, Estimates and Complete Working Plans and Specifications for Laying out and Planting, also for Drainage, Paving and all other Improvements.

J. L. LUDLOW
Winston-Salem, N. C.
Consulting Municipal Engin
Sanitary and C ·le Expert
Water Supplies, Sewage Disposal, I
Plans, Valuations, Appraisals. Efficien
Economy Studies, Physical and Financial I
on Public Utilities in Southern Cities.
in Municipal Sanitation and Public Health.
views by appointment in Eastern Cities.

Sid. J. Hare, Fellow A.S.L.A. — S. Herbert Hare, Member A.S.L.A.
HARE & HARE
Landscape Architects
604 Gumbel Bld., Kansas City, Mo.
Plans and Reports for Parks, Park Systems, Land Subdivisions, Estates, Municipal Improvements, Cemeteries

The
JENNINGS-LAWRENCE CO.
CIVIL AND MUNICIPAL ENGINEERS
511-12 Hartman Bldg.
COLUMBUS OHIO

THOMAS MEEHAN & S
Practical Landscape Garden and Engineers
Especially qualified for work involvi of hardy plants. Large estate de ments: country clubs. Plans execut
"We know plants"
6703 Chew Street, Germantown, Phil

HAZEN, WHIPPLE & FULLER
CONSULTING HYDRAULIC and SANITARY ENGINEERS
WATER SUPPLY and SEWERAGE
Allen Hazen, W. E. Fuller, C. M. Everett, G. C. Whipple, F. F. Longley, L. N. Babbitt, H. Malcolm Pirnie
30 East 42d St. NEW YORK CITY

GEORGE A. JOHNSON
M. Am. Soc. C.E.
Consulting Hydraulic Engineer and Sanitary Expert
150 Nassau St., New York.
Water Supply and Purification. Sewerage and Sewage Disposal. Plans and Reports. Supervision of Construction. Valuations. Improved Operation of Existing Plants. Investigation of Epidemics.

HUGH C. MITCHEL
GEODETIC ENGINEER
CONSULTANT ON CITY TRIANGULA PRECISE LEVELS, AND TOPOGR SURVEYS.
601 West 32d Street
AUSTIN, TEXAS

Arthur H. Helder
Landscape Architect
413 Reliance Bldg. Kansas City, Mo.

MUNICIPAL PROBLEMS
Budget Making—Salary Standardization—Centralized Purchasing—Cost Accounting—Public Utility Service and Rate Studies
J. L. JACOBS & COMPANY
Engineers—Cost Accountants—Municipal Experts
Monadnock Building Chicago

FRANK H. NUTTE
Landscape Architect and Engin
710 Sykes Block, Minneapolis,
Advice, Sketches, Designs or full ing Plans for Parks, Cemeteries, or Home Grounds Surveys m desired. Correspondence Solicite
City Park Engineer from 1883 to

Rudolph Hering, D.Sc.
Consulting Engineer
170 Broadway New York
WATER SUPPLY, SEWAGE AND REFUSE DISPOSAL
Over 40 years active practice in United States and Canada

H. C. KITTREDGE
Consulting Hydraulic and Sanitary Engineer
ROCHESTER, N.Y.

POLLOCK AND TAE
CONSULTING ENGINEE
Pavements, Highways, Water S Drainage, Sewerage and Sewage Di
Designs, Specifications and Superv
Clarence D. Pollock, George A. Taber — Memb Am. Soc.
Park Row Building, New York

J. Wallace Higgins
Assoc. M. Am. Soc. C. E.
CIVIL AND LANDSCAPE ENGINEER
Municipal Engineering, Sewerage, Parks, Cemeteries, Subdivisions, Topographic Surveys, Title Surveys, Estimates, Supervision
52 Vanderbilt Avenue, New York

A. Elliott Kimberly
SANITARY ENGINEER
Water Supply, Water Purification, Sewerage, Sewage Treatment, Industrial Waste Disposal
8 East Long St. COLUMBUS, OHIO

Alexander Potter, C
Hydraulics, Sanitation, crete Structures Designe Executed.
50 Church Street, New Y
(Hudson Terminal) Tel., Cortland

Charles C. Hopkins
M. Am. Soc. C. E.
Consulting Hydraulic and Sanitary Engineer
349 Cutler Bldg., Rochester, N.Y.
Water supply and purification. Sewerage. Sewage and wastes disposal. Municipal engineering. Plans, reports, estimates, supervision. Expert testimony and appraisals.

MORRIS KNOWLES
Consulting, Sanitary and Hydraulic Engineer
Municipal, Community and Civic Problems
Pittsburgh, Penna.

Clyde Potts
30 CHURCH ST. NEW Y
Civil and Sanitary Engine
Sewerage and Sewage Disposal Hydraulics, Water Works, Filt Reports, Plans and Estimates.

M. H. HORVATH
Landscape Architect & Consulting Forester
649 Leader-News Bldg.
Cleveland, Ohio

CHARLES W. LEAVITT
CITY PLANNING
and all branches of
CIVIL and LANDSCAPE ENGINEERING
220 Broadway NEW YORK

LOUIS E. STAND
Certified Public Accounta
Municipal and Public Utility Acco Rate and Capitalization Case
200 Fifth Avenue, New Y
Chief Acct.—Bd. of Ed. 1899-19
Acct—Pub. Service Com. 1908-1
Chief Auditor—Dept. Water Suppl and Electricity, 1912-1916.

ewage Disposal Plants

Country Residences, Factories and Institutions. Standard Plans and Specifications cluding description and estimate of cost modern sewage treatment.

Blue Prints, 12 sheets, 9" x 12", $5.00

Roy K. Sherman, Sanitary Engineer, 1102 Tacoma Bldg., Chicago.

TRACY, L. D.

Assoc. Mem. Am. Soc. C. E.
Civil and Sanitary Engineer

Examinations, Surveys and Reports Made
Plans and Specifications Prepared for
Sewerage and Sewage Disposal Plants
Roads and Pavements

245 Fourth Ave. Pittsburgh, Pa.

WARREN ENGINEERING CO.

Specializing in Municipal Water Supply and Purification, Sewerage and Sewerage Disposal, Paving.

DECATUR ILLINOIS

ew York City 2 Rector Street

A. F. HANSEN

Hydraulic & Sanitary Engineer

Design & Supervision of Construction

werage	Water Works
wage Disposal	Water Purification
ainage	Water Works Valuation
rbage Disposal	Water Analyses

UTILITIES ENGINEERING CO.

S. Moreell F. C. Van Etten
O. F. Gayton R. F. Gayton

Plans, Superintendence-Reports, Valuations, Water, Gas, Electric Plants, Bridges, Buildings, Sewerage, Sewage Disposal

Webster Building, Chicago

Washtenaw Engineering Company

ANN ARBOR, MICH.

Water Supply; Sewerage and Sewage Disposal; Refuse Disposal; Roads and Pavements; Highway Bridges and Culverts; Drainage; Land Surveying, Subdividing, and Platting; Municipal Accounts and Systems; Municipal Street Lighting.

lbany, N. Y 100 State St.

HENRY W. TAYLOR

YDRAULIC AND SANITARY ENGINEER

ater Supply, Water Purification, Sewerge, Sewage Disposal, Reports, Plans, Supervision of Construction and Maintenance

Shall we send you our

Selected List of Municipal and Civic Books?

THE CIVIC PRESS

87 Nassau Street New York

WHITMAN & HOWARD

CONSULTING ENGINEERS

FOR ALL MUNICIPAL ENGINEERING PROBLEMS

220 Devonshire Street
BOSTON, MASS.

. SCOTT TWOGOOD

Civil and Sanitary Engineer

14-15 Bank of Commerce and Trust Bldg
MEMPHIS, TENN.

ater Supply, Water Purification, Sewerage stems, Sewage Disposal, Reinforced Conete Structures, Municipal Improvements, eration of Purification Plants, Laboratory for Analysis of Water and Sewage.

WAGNER LANDSCAPE SERVICE

Will submit designs, complete planting plans for Parks, Cemeteries, Public or Private Grounds no matter where located. Write us today.

The Wagner Park Nursery Co.
Box A Sidney, Ohio

MARK WOLFF

Certified Public Accountant

Consultant
Rate & Capitalization Cases
Gas, Electric & Water Utilities

1328 Broadway
New York City

Municipal Accounting

Robert W. Hunt Jno. J. Cone Jas. C. Hallsted D. W. McNaugher

ROBERT W. HUNT & CO., GENERAL OFFICES: 2200 Insurance Exchange, Chicago, Ill.

ENGINEERS, INSPECTORS, CHEMISTS

Inspection Steel and Cement for Buildings and Bridges, Paving Materials, Cast Iron Pipe.
Inspectors Permanently at Points of Manufacture.

Did You Read Page 35?

You'll be missing something of value if you don't.
Turn to page 35 now.

Butler Refuse Cans

re neat cans

The collected refuse in utler Cans doesn't show up efore your eyes.

It is covered from view (see ustration). These cans are ipped "knock-down" thus ving big freight bills. Write for particulars.

The Butler Mfg. Co.
St. Anthony Falls Sta.
Minneapolis, Minn.

lso makers of "Rusruf" corrugated culverts with B.M.C. Wings

King Poles and G. E. tops make the best lighted streets

Send for our beautifully illustrated booklet—free. Send name and address today.

KING FOUNDRY CO.
55 W. Jackson Blvd.
Chicago, Ill.

Civil Engineering

9 Big Volumes Shipped to You FREE

3900 Pages (7x10 in.) 3000 Plates, Maps, Diagrams, Etc. Bound in Half Morocco.

Quick action secures this great *Library of Civil Engineering* at a record-breaking low price, on little, easy payments. Covers the whole broad field of Civil Engineering in simple, easily-understood language. Helps ambitious young men qualify for this big-paying profession at home, in their spare time. Mail the coupon! We'll send you a set, shipping charges collect, for 7 days' free trial.

50c a Week

Important Subjects Covered

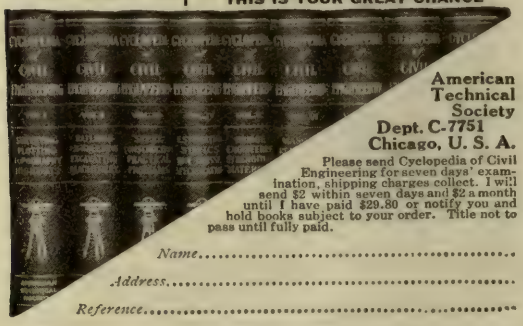
Plane Surveying—Plotting and Topography—Highway Construction — Railroad Engineering — Earthwork —Steel Construction—Estimating for Steel Buildings — Statics — Roof Trusses — — Civil Specifications and Contracts — Bridge Engineering — Strength of Materials — Masonry and Reinforced Concrete —Water Supply—Sewers and Drains —Hydraulics—Water Power Development—River Improvement — Harbor Improvement — Cost Analysis Engineering—Dams & Weirs —Irrigation Engineering.

Entire nine-volume set shipped charges collect for a full week's examination. If you keep it, send $2.00 within seven days and $2.00 a month (50c a week) thereafter until $29.80 has been paid. This is $15.20 less than the regular price of $45. ACT NOW! Offer open to every person within boundaries of U. S. and Canada.

Consulting Service FREE

We give a Consulting Membership in the American Technical Society (regular price $12) FREE with each set. This entitles you to the personal advice of a corps of Civil Engineers for an entire year. Thousands of Civil Engineers called to War Service. Big jobs everywhere must be filled.

THIS IS YOUR GREAT CHANCE



American Technical Society
Dept. C-7751
Chicago, U. S. A.

Please send Cyclopedia of Civil Engineering for seven days' examination, shipping charges collect. I will send $2 within seven days and $2 a month until I have paid $29.80 or notify you and hold books subject to your order. Title not to pass until fully paid.

Name.....

Address.....

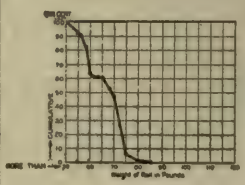
Reference.....

KEEP LIVE RECORDS THIS YEAR

Picture your work in live, interest-compelling

Graphic Charts and Maps

Show your public what is being accomplished in a tangible easily inderstood, easily maintained record.

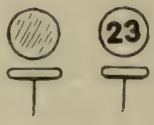


EdExCo Charting Paper

simplifies the plotting of curves that visualize the year's progress —show your gains and economies and

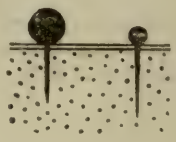
MAKE DRY FIGURES ALIVE

Health, School, Street and Sewer Departments can use



EdExCo Glass Head Colored Map Pins

to show details, either permanent or transient.



Tell Us Your Problems

and we will suggest best method of charting and illustrating your work, drawing special charts when desired.

Send for our free booklet. It illustrates many uses of charts and pins.

Educational Exhibition Co.

126 Custom House Street

Providence, R. I.

DU PONT AMERICAN INDUSTRIES

The Builder of Nations—Dynamite

Mail this Coupon marking X before subject that interests you

- ☐ Industrial Dynamites
- ☐ Blasting Powder
- ☐ Farm Explosives
- ☐ Blasting Supplies
- ☐ Trapshooting
- ☐ Py - ra - lin Toilet Goods
- ☐ Challenge Collars
- ☐ Sanitary Wall Finish
- ☐ Town & Country Paint
- ☐ Liquid Light for Mills
- ☐ RayntiteTopMaterial
- ☐ Motor Fabrikoid
- ☐ Metal Lacquers
- ☐ Commercial Acids
- ☐ Pigment Bases
- ☐ Tar Distillates
- ☐ Dyes and Bases

Name.....

Address.....

City.....

State.....

A titantic laborer—wresting from the bosom of Mother Earth the stone, the ore, the coal, that are essential to modern life—tunneling under rivers and through mountains for the railroads that span the continent, and cleaving hemispheres for the canal that links the oceans.

In this class of constructive national forces the palm of leadership goes to

DU PONT

Red Cross Dynamite

the world's leading brand of industrial explosives. Powerful, quick, low-freezing, insensitive to ordinary shocks of transportation and handling. Safer than gasoline or gunpowder. It represents a distinct achievement of American scientific research and manufacturing skill. Many million of pounds are used annually by civil, railroads and mining engineers, contractors, road builders, quarrymen and farmers.

It is not a fearsome Frankenstein but a tractable, powerful servant. Learn its uses. Fill in and check the coupon opposite. 'Industrial Explosives" or "Farm Explosives" and send for full information.

E. I. Du Pont De Nemours & Co.

Established 1802

Wilmington, Delaware

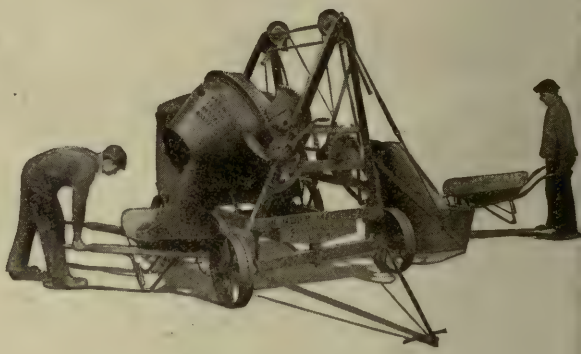
DU PONT

Jaeger Concrete Mixer

Used by all progressive municipalities and contractors.

Is your town progressive?

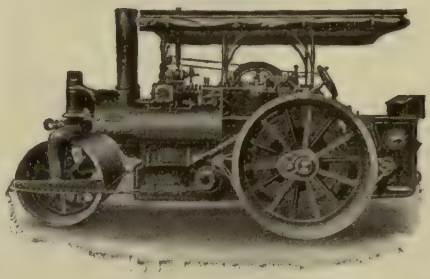
Write for Data



THE JAEGER MACHINE CO

215 West Rich Street :: Columbus, Ohi

QUALITY MACHINERY



BUFFALO PITTS ROLLER

Are purchased by discriminating buyers becaus of the many years of satisfactory service whic they will render, the low repair costs and thei general reliability.

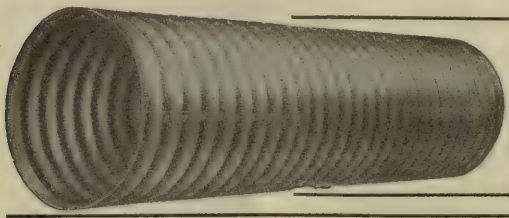
ASK THOSE WHO OWN THEM

All sizes All Types Write for catalogu

Built only by

THE BUFFALO-SPRINGFIELD ROLLER COMPA

SPRINGFIELD, OHIO



Collieries Supply and Equipment C

Culvert Pipe and Road Machinery

Contractors, Road Makers and Municipal Suppli

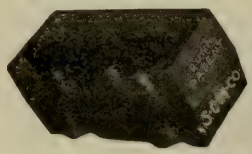
Sectional Cast Iron Culvert Pipe Corrugated Iron C Pipe Scarifiers Road Signs Road Scrapers Road Rock Crushers Road Rollers Write for

14 North Fifth Street Philadelphi

SOUTHERN CLAY MFG. CO.

James Building

CHATTANOOGA, TENN.



Annual Capacity: Thirty Million Paving B

Manufacturers of

WIRE-CUT-LUG BLO

DUNN PATENT

Announcement

On and after February 1, 1918 our general offices will be located at 7323 Woodlawn Ave., Chicago, Ill., and we respectfully request all our friends and customers to address all communications to the Company at our new location after this date.

We shall continue to produce a full line of bituminous products of the highest quality, and asphalts for every purpose, and whenever you are in the market for paints, pipe coatings, expansion joint, mineral rubber, insulation compound, filler, road asphalt, roofing cement, waterproofing or any other bituminous products of similar nature, kindly give us an opportunity of figuring with you on your requirements.

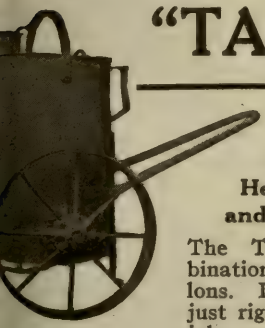
Our Policy—"A Personal Interest in Every Order; An Earnest Endeavor to please."

THE PIONEER ASPHALT CO.

Producers of Highest Quality Bituminous Products.

Chicago, Ill. **Lawrenceville, Ill.**

Wastes on Repair Jobs---Saved By "TARCO"



"TARCO" Combination Heating Kettle and Pouring Pot

The TARCO Combination holds 10 gallons. It's small but just right for a small job.

This combination can be used practically any small job and is suitable for heating and pouring all kinds of bituminous road preparations. It takes less men, less time and less money to operate.

Let us send you information about how it built. Write now.

THE TARRANT MFG. CO.
Maple Ave. Saratoga Springs, N. Y.

Ransome-Leach Company

Representing a new service for contractors and builders. A combination of great importance to contractors and builders marking a new era in the contractors equipment field has been completed in the consolidation of the Ransome Concrete Machinery Company and the Oshkosh Manufacturing Company.

This new organization, known as the Ransome-Leach Company, through economic effort in manufacturing and marketing offers a service that has a far reaching significance for both contractor and dealer. A service that has hitherto been unapproached in the contractors world.

Ransome-Leach Company

NEW YORK - 115 BROADWAY
OSHKOSH, WISCONSIN

What Is Fair

A study and Some Problems of Public Utility Regulations. By William G. Raymond, Professor of Civil Engineering, and Dean of the College of Applied Science in the State University of Iowa.

The result of an honest effort, extending over some years, to determine just what is fair in the relationships of the public and the owners of its utilities. xiii + 172 pages. 4¼ by 6½. Cloth, $1.00 net.

Three Books by Dr. Harvey B. Bashore, Inspector for State Board of Health, Pennsylvania.

The Sanitation of a Country House

A book written with the aim of making the country as healthy as the city. vii + 112 pages. 16 full page half-tone illustrations. 5 by 7¼ Cloth, $1.00 net.

Outlines of Practical Sanitation for Students, Physicians, and Sanitarians

Contains subjects of interest to the tax payer and the citizen, as well as health officials. vi + 208 pages. 42 illustrations, many half-tones. 5 by 7¼. Cloth, $1.25 net.

The Sanitation of Recreation Camps and Parks

A guide for the selection of proper sites for recreation camps and parks, and their sanitary care. xiii + 109 pages. 19 full page half-tone illustrations. 5 by 7¼. Cloth, $1.00 net.

THE COST OF LIVING SERIES

By Ellen H. Richards, late instructor in Sanitary Chemistry, Massachusetts Institute of Technology.

The Cost of Living as Modified by Sanitary Science

Third edition, enlarged. A book written to present the board view of sanitary science. xi + 154 pages. 5 by 7¼. Cloth, $1.00 net.

The Cost of Food

A Study in Dietaries. Third Edition, Revised under the direction of John F. Norton, Ph. D., Assistant Professor of Chemistry and Sanitation, Massachusetts Institute of Technology.

A book dealing with the cost of food under all conditions. xi + 148 pages. 5 by 7¼. Cloth, $1.00 net.

The Cost of Shelter

Treating the subject of housing from all standpoints. vi + 136 pages, illustrated. 5 by 7¼. Cloth, $1.00 net.

The Cost of Cleanness

Dealing with the problems of Personal Cleanness, Clean Houses, and Clean Cities. v + 109 pages. Cloth, $1.00 net.

10 DAYS FREE EXAMINATION

John Wiley & Sons, Inc., 432 Fourth Ave., N. Y. City.

Gentlemen:—Kindly send me for 10 days free examination the following books:

.....

.....

.....

It is understood that I am to remit the price of these books, or return them, carriage charges prepaid, within 10 days after their receipt.

Name.....

Address.....

(Indicate on the line above if you are a subscriber to American City; or give the name of the engineering society of which you are a member. If you are not a member of any society, kindly give a reference or state your position. AC 1-18

Free Examination — No Cash In Advance

You can examine these books for 10 days without sending cash in advance. This privilege is extended to subscribers to *American City*, or to members of any National engineering society. If you are not a subscriber or a member of any society, you can supply a reference or indicate your position.

JOHN WILEY & SONS, Inc.

432 Fourth Avenue, New York

London: CHAPMAN & HALL, Ltd.

Montreal, Canada
Renouf Publishing Co.

Manila, P. I
Philippine Education Co

Try out a KOLESCH Instrument on your work —at our expense.

We will gladly send Municipal Engineers an instrument to test, without any obligation to purchase until it has proved its worth. **KOLESCH GIVES SERVICE.**

Send for Catalog of our complete line of High Grade Engineers' Instruments and Supplies.

Transit 7670

KOLESCH & CO., 138 Fulton St., New York

"The Spring's the Thing"

SHAWNEE MOWER CO., 5 Beekman St., N. Y.

BUFF

ENGINEERING INSTRUMENTS

are the strongest, most accurate and longest-lived Instruments built. The close accuracy, high grade materials and superior workmanship have made the Buff the recognized standard. *Write for catalog No. 4.*

BUFF & BUFF MFG. CO.

Jamaica Plains, BOSTON, MASS.

221 Lamartine Street **231 N. Fifth Ave., Chicago, Ill.**

ODORLESS **STAINLESS**

DUSTOLINE FOR ROADS

TRACKLESS **(TRADE MARK)** **TRANSPARENT**

THE DUSTOLINE FOR ROADS CO., Summit, N. J., Phone 33

Has none of the objectionable features of the black asphaltic oils or tar preparations

Street Signs Road Guide Posts Traffic Signs

The Kind That Last

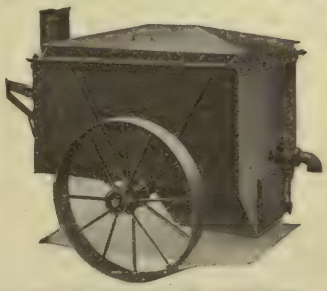
Made of Heavy Galvanized Iron with letters sunken into plate.

If you are looking for *permanent* signs instead of the short lived ordinary variety write to us for prices, illustrations and further particulars.

Union Iron Products Co.

Drawer H-2 **E. CHICAGO, IND.**

Littleford Tar Heaters



Many municipalities have found the **"Littleford"** a valuable and economical asset in Street Repair work.

Write for booklet.

LITTLEFORD BROS. 500 E. Pearl St., Cincinnati

Proposal and For Sale Notices, Help Wanted and Situation Wanted Advertisements, Etc.

NOTICE TO CONTRACTORS.

Sealed proposals will be received by the Board of Commissioners of Jersey City,

TUESDAY, FEBRUARY 5, 1918

at 2 p. m., in the Assembly Chamber, City Hall, Jersey City,

FOR THE CONSTRUCTION OF A WATER MAIN UNDER HACKENSACK AND PASSAIC RIVERS.

in accordance with specifications on file in the office of the City Clerk.

Blank forms of bid, showing estimate of quantities and agreements of sureities, must be obtained at the office of the Chief Engineer, City Hall, Jersey City, N. J.

Proposals must be enclosed in sealed envelopes endorsed "Proposal for Water Main," addressed to this Board, and may be either mailed, delivered or handed to the City Clerk, which proposals must be received at the time above mentioned to be presented in open meeting when called for in the other of business relating to sealed proposals.

The bonds required to be furnished on proposals (and a possible subsequent contract) are those of some surety company authorized to do business in the State of New Jersey, or of two responsible real estate owners of Hudson County, or a certified check will be accepted in lieu of bond.

The Board reserves the right to reject any or all proposals if it is considered for the best interests of the city so to do.

By order of the Board of Commissioners of Jersey City.

Dated City Clerk's Office,
Jersey City, December 11, 1917.

FRANK A. DOLAN, City Clerk.

ROAD CONSTRUCTION

IROQUOIS, ONT.

Sealed Tenders, marked "Tender for Road Construction," will be received by Adrian I. MacDonell, County Clerk, Cornwall, Ont., until noon, Monday, January 21st, 1918, for the construction of approximately 60 miles of County Road.

Tenders may be submitted on sections of five miles or more, each tender to be accompanied by a cash deposit or marked cheque equal to five per cent of the tendered price.

Plans, profiles and specifications may be seen and forms of tender obtained at the office of J. G. Cameron, C. E., County Road Superintendent, Finch, Ont.

The lowest or any tender not necessarily accepted.

(Signed) ELI MERKLEY,
Chairman Road Committee,
Iroquois, Ont.

FIRE APPARATUS AND HOSE

LEBANON, ILL.

Notice is hereby given that the city of Lebanon, St. Clair County, Illinois, will receive bids for furnishing the city of Lebanon, Ill., one fire engine, either gasoline, motor power, hand-drawn or motor-driven, capacity 350 gallons per minute; also a two-tank chemical engine, capacity 35 gallons, hand-drawn and up to 1,000 feet single jacket hose. Bids will be received to 12 o'clock, noon, the 21st day January, 1918, directed to H. C. Eis mayer, Mayor of the City of Leban Ill. The city reserves the right to ject any or all bids.

This 11th day of December, 1917.

H. C. EISENMAYER,
Mayor.

E. P. BAKER,
A. DERLETH,
J. J. SHANNON,
Committee.

Chamber of Commerce Manager Wanted

Industrial training and experience required. Correspondence invited.

Address, Secretary,
Morgan City, La.

STEWART IRON FENCE
"The Standard of the World"

beautifies and protects public property economically, permanently, satisfactorily.

The fencing of reservoirs at Chattanooga, Tenn., Fort Thomas, Ky.; Butte, Mont., and pumping stations at New York City and Seattle, Wash., are typical Stewart installations.

Stewart Iron Fence and Gates for hospitals, schools, parks, playgrounds and public buidlings. Write for big illustrated catalog.

THE STEWART IRON WORKS CO.
(Incorporated)
527 Stewart Block Cincinnati

Wanted

Playground Director and Beach Master, season 1918.

Apply Benj. E. Gage,
721–30 N. La Salle St.,
Chicago, Ill.

Bad Acoustics Corrected

in this (Denver Auditorium) and hundreds of other auditoriums, churches, etc. throughout the U. S. and Canada, with,

Acoustile
THE PERFECTOR OF ACOUSTICS

A permanent wall and ceiling treatment guaranteed to produce perfect hearing conditions. No change necessary in appearance of room. Write for illustrated booklet and references

MAZER ACOUSTILE CO., 527 Third Ave., Pittsburgh, Pa.

Established 1909 Acoustical Engineers and Contractors

GOOD ROADS AT SMALL COST

SOLVAY is a remarkably satisfactory and economical road-binder. Its effects are immediate and lasting. It quickly incorporates with the road-bed, hardens the surface and keeps it free from ruts, weeds and dust. It is simple to apply, and easy to maintain. Its application need not interfere with traffic.

SOLVAY Granulated Calcium Chloride

is a clean chemical salt. It is odorless, and will not "track" or ravel. It has many advantages and no objectionable features. Its durability, its economy of material and labor—the reduction it makes in the cost of upkeep, are extremely important to those who are seeking to establish better roads at small cost.

All interested in good roads are invited to write for the "Solvay Road Book," mailed free, upon request.

SEMET-SOLVAY CO.
410 Milton Avenue, Solvay, N. Y

(An "Armco" Iron Culvert being placed under the California State Highway near Fresno, California.)

When War Makes Labor Scarce

it is a satisfaction to know that unskilled men can install

"ARMCO" IRON CORRUGATED CULVERTS

quickly and efficiently. They are shipped without delay, hauled easily, placed quickly, and will last a generation.

Their unfailing durability is their chief recommendation. They are made of "Armco" iron—the purest and most rust-resisting iron that can be used.

For full information on Rust-Resisting "Armco" Iron Culverts, Flumes, Siphons, Sheets, Roofing, and Formed Products, write.

AMERICAN ARMCO Resists Rust

Armco Iron Culvert & Flume Mfrs. Association, Cincinnati, Ohio

Grading Streets in Dallas, Texas

Moves More Dirt With Less Power

The Adams Leaning-Wheel Grader, or Scarifier-Grader, which leans against the load, can grade and shape up a gravel or MacAdam street, with greater ease and use less power, than any other type of grader. The

ADAMS ADJUSTABLE *Leaning-Wheel* GRADER

is guaranteed in actual road building or maintenance, to move more dirt with less power (mold board scouring and without side draft on the power) than any other grader of same length of blade.

The economy and efficiency of the ADAMS Adjustable Leaning-Wheel Grader can be PROVED by TEST on your own road, before a sale is made. Write for free illustrated catalog showing ADAMS Adjustable Leaning-Wheel Graders at work under various conditions. Ask for Catalog C.

The ADAMS Leaning-Wheel Grader leans against the load just as you'd do if you were pushing a wheel-barrow up a hill. Catalog C gives full information.

J. D. ADAMS & CO.
Road Building Machinery
INDIANAPOLIS, IND.

Classified Reference Index

of advertisers in this issue of The American City

The alphabetical index of advertisers which follows this list (see page 98) will give you the page numbers of all advertisements, thus enabling you to secure the full address of the advertisers, as well as other information which may be of value.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 98

Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark

Acoustics.
Mazer Acoustile Co.

Air Compressors.
General Electric Co.
Modern Iron Works
Water Works Equipment Co.
Worthington Pump & Mach. Corp.

Air and Gas Washers.
Spray Engineering Co.

Ambulances.
Studebaker Corporation
White Co., The

Antoxide.
Harrisons, Inc.

Arc Lamps.
General Electric Co.
Westinghouse Elec. &Mfg. Co.

Armored Concrete Pavements.
Trussed Concrete Steel Co.

Asbestos.
Carey Co., Philip.

Asphalt.
Barber Asphalt Paving Co.
Carey Co., Philip.
Pioneer Asphalt Co.
Standard Oil Co.
Warren Bros. Co.

Asphalt Blocks.
Barber Asphalt Paving Co.

Asphalt Machinery.
Barber Asphalt Paving Co.
Casey-Hedges Co.
Littleford Bros.
Tarrant Mfg. Co.
Warren Bros. Co.

Automobile Fire Apparatus.
American-La France Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Duplex Truck Co.
Federal Motor Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
South Bend Motor Car Works.
Studebaker Corporation
The White Co.

Automobile Lubricants.
Joseph Dixon Crucible Co.

Belt Dressing.
Joseph Dixon Crucible Co.

Blasting Supplies.
DuPont de Nemours & Co., E. I.

Blue Print Paper and Machines.
Kolesch & Co.

Braces, Extension.
Bond & Co., Harold L.
Modern Iron Works.

Brass Goods.
Anderson Coupling & Fire Sup. Co.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co

Brick, For Paving.
Dee Co., Wm. E.
Metropolitan Paving Brick Co.
Southern Clay Mfg. Co.
Schuylkill Valley Vit. Products Co

Buses, Motor.
Studebaker Corporation.
White Co., The

Calculating Machines.
Marchant Cal. Machine Co.

Campaigns for Commercial Organizations.
American City Bureau.

Cans for Ashes and Garbage.
American Can Co.
Baker Mfg. Co.
Buffalo Municipal Equipment Co.
Butler Mfg. Co.
Newport Culvert Co.
Rochester Can Co.
Steel Basket Co.

Can Carriers.
Steel Basket Co.
Tarrant Mfg. Co.

Cast Iron Pipe.
Donaldson Iron Co.
Glamorgan Pipe & Foundry Co.
Lynchburg Foundry Co.
Massillon Iron and Steel Co
Zelnicker Supply Co., W. A.

Catch Basins.
Casey-Hedges Co.
Clark Co., H. W.
Clow & Sons, James B.
Dee Co., Wm. E.
Modern Iron Works.
U. S. Cast Iron Pipe & Foundry Co

Caulking Materials.
Leadite Co.
Modern Iron Works.
United Lead Co.

Cemcoat.
Sonneborn Sons, Inc., L.

Cement
Atlas Portland Cement Co.
Pennsylvania Cement Co.

Cement Inspection.
Hunt & Co., Robt. W.

Centrifugal Pumps.
Shone & Co.
Worthington Pump & Mach. Corp.

Certified Public Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark

Check Valves.
Columbian Iron Works.

Chemical Analysis.
Hunt & Co., Robt. W.

Chemical Engines.
American-La France Fire Engine Co
Anderson Coupling & Fire Sup. Co.

Chemical Engineers.
Hunt & Co., Robt. W.

Chemicals for Water Purification.
Arnold, Hoffman & Co.
Bush-Beach & Gent.
Electro Bleaching Gas Co.
Great Western Electro Chem. Co.
Pennsylvania Salt Mfg. Co.
Wallace & Tiernan Co., Inc

Coal Tar.
Barrett Co., The
Carey Co., Philip.
Republic Creosoting Co.

Cold Storage and Refrigeration Systems.
Spray Engineering Co.

Concrete Mixers.
Jaeger Machine Co.
Ransome Concrete Machy. Co.
Worthington Pump & Mach. Corp

Conduit Rods.
Bissell Co., F.
Bond & Co., Harold L.
Turbine Sewer Machine Co.

Conduits.
Fibre Conduit Co.
Schuylkill Valley Vit. Prod. Co.

Contractors' Equipment.
Adams & Co., J. D.
Austin-Western Road Machy. Co
Baker Mfg. Co.
Barber Asphalt Paving Co.
Bond Co., Harold L.
Duplex Truck Co.
Federal Motor Truck Co
Garford Motor Truck Co.
General Motors Truck Co.
Good Roads Machinery Co.
Littleford Bros.
Packard Motor Car Co.
Ransome Concrete Machy. Co..
Russell Grader Mfg. Co.
Spaulding Mfg. Co.
Universal Road Machinery Co.

Contractors for Water Main Cleaning.
National Water Main Cleaning Co

Creosoted Wood Block Pavements.
Barber Asphalt Paving Co.
Republic Creosoting Co.

Culverts.
American Cast Iron Pipe Co.
Armco Iron Cul. & Flume Mfrs. Assn
Baker Mfg. Co.
Casey-Hedges Co.
Clow & Sons, James B.
Collieries Supply & Equipment Co
Dee, Wm. E. Co.
Good Roads Machinery Co.
Newport Culvert Co.
Trussed Concrete Steel Co.
Sewer Pipe Mfrs. Association
U. S. Cast Iron Pipe & Foundry Co
Wood & Co., R. D.

Curb Bar.
Trussed Concrete Steel Co.

Curb Boxes.
Casey-Hedges Co.
Clark Co., H. W.
East Iron & Machine Co.
Modern Iron Works
S. E. T. Valve & Hydrant Co.

Current Meters.
Gurley, W. & L. E.
Westinghouse Electric & Mfg. Co

Drawing Instruments and Supplies.
Gurley, W. & L. E.
Kolesch & Co.

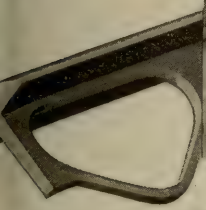
Dump Carts and Wagons.
Austin-Western Road Machy. Co
General Motors Truck Co.
Studebaker Corporation.
Watson Wagon Co.

Dumping Wagon Bodies.
Austin-Western Road Machy. Co
Studebaker Corporation.

Continued on page 90

BACK OF THE PERFECT CURBING ARE KAHN CURB BARS

They provide the st and most econom- l method of pro- ting and reinforcing ncrete curbing for her business or resi- ntial streets. There no separating or itting of the con- te at the corners, on count of the open ces in the anchorage, ich is absolutely sitive.



Kahn Curb Bars are manufactured from special rolled steel sections, and are heavily galvanized after forming. They are furnished in either straight or curved bars and provide a protection of 1⅝ inches. Standard lengths 8, 10 and 12 feet.

TRUSSED CONCRETE STEEL COMPANY

Department C-43 **Youngstown, Ohio**

Representatives in Principal Cities

KAHN Building Products TRUSSED CONCRETE STEEL CO.

Monarch Tandem Roller

Because of Labor and Material Shortage Machinery will be the Dominant Factor in Building and Maintaining Streets and Roads

We furnish a complete line of Street Building Equipment for Cities, Counties and Towns, including Steam Road Rollers, all sizes, Portable and Stationary Crushing Plants, Oil Distributors, Heating Kettles, Street Sweepers, Road Graders, Rooter Plows and Culvert Pipe. Catalog and prices on application.

Made in 5, 6, 9 and 10 ton sizes. A small portable crushing plant, like the Champion, will enable cities to secure crushed stone from local deposits. Crushed stone will be hard to get in any other way during the coming year.

Write today for prices. Don't wait.
Delays this year will be dangerous.

THE GOOD ROADS MACHINERY CO.

Kennett Square, Pa.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 9

Dust Laying Compounds.
Barrett Mfg. Co.
Dustoline for Roads Co.
Semet-Solvay Co.
Standard Oil Co.

Electric Current Meters.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Generators and Motors.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Lamp Fixtures.
Cutter Co., George.
Electric Railway Equipment Co.
Holophane Glass Co., Inc.

Electric Lamps.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electrical Supplies.
Bissell Co., F.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Enameled Iron Signs.
Baltimore Enamel & Novelty Co.

Engineers' and Surveyors' Instruments.
Buff & Buff Mfg. Co.
Kolesch & Co.

Engineers, Consulting.
Albright & Mebus.
Alvord, John W. & Brudick, Chas.
Ballard & Co., F. W.
Black & Veatch
Blanchard, A. H.
Burns & McDonnell.
Caird, James M.
Chester & Fleming.
Cravath, J. R.
Crosby, W. W.
Duluth Engineering Co.
Dunham-Clarin Co.
Flood, Walter H.
Fuller & McClintock.
Gannett, Seelye & Fleming.
Greeley, Samuel A.
Gregory, John H.
Harding, James.
Hazen, Whipple & Fuller.
Hering, Rudolph
Higgins, J. Wallace.
Hopkins, Charles C.
Hunt & Co., Robt. W.
Iredell, Geo. S.
Jennings, Lawrence & Lindsey.
Johnson, Geo. A.
Kimberly, A. Elliot
Knowles, Morris.
Leavitt, Chas. W.
Ludlow, J. L.
McCrary Co., J. B.
Minnesota Engineering Co.
Mitchell, Hugh C.
Pollock, Clarence D.
Potter, Alexander.
Potts, Clyde.
Scofield Engineering Co.
Taylor, Henry W.
Tracy, L. D.
Utilities Engineering Co.
Warren, Engineering Co.
Washtenaw Engineering Co.
Whitman & Howard

Engine, Gas. (See Gas Engines.)

Expansion Joint Material.
Barber Asphalt Paving Co.
Barrett Mfg. Co.
Carey Co., Philip.
Pioneer Asphalt Co.
Trussed Concrete Steel Co.

Fencing.
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Co.
Wright Wire Co.

Fertilizers.
Dreer, Henry A.

Filters-Feed Water.
Pittsburgh Filter Mfg. Co.

Filtration Plants.
N. Y. Continental-Jewell Filtra. Co.
Norwood Engineering Co.
Pittsburgh Filter Mfg. Co.

Fire Alarm Cables.
Bissell Co., F.
Simplex Wire & Cable Co.

Fire Alarm Signals, Steam.
Union Water Meter Co.

Fire Alarm Systems.
Anderson Coupling & Fire Sup. Co.
Gamewell Fire Alarm Telegraph Co.
Loper Fire Alarm Co.

Fire Department Apparatus.
American-LaFrance Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Duplex Truck Co.
Federal Motor Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
South Bend Motor Car Works.
Studebaker Corporation.
White Co. The

Fire Department Supplies.
Anderson Coupling & Fire Sup. Co.

Fire Escapes.
Barnum Iron Works, E. T.

Fire Extinguishers, Chemical.
American LaFrance Fire Engine Co.
Anderson Coupling & Fire Sup. Co.

Fire Hose.
Anderson Coupling & Fire Sup. Co.
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

Fire Pumps.
Worthington Pump and Machinery Corporation.

Flag Poles.
Barnum Iron Works, E. T.

Flexible Joints.
U. S. Cast Iron Pipe & Fdry. Co.

Flower Bed Guards.
Barnum Iron Works, E. T.
Wright Wire Co.

Fountains.
Barnum Iron & Wire Works, E. T
Casey-Hedges Co.
Clow & Sons, James B.
Mott Iron Works, J. L.
Rundle-Spence Mfg. Co.
Stewart Iron Works Co.

Furnaces, Melting.
Leadite Co.
Modern Iron Works

Garbage Cans—See Cans for Ashes and Garbage.

Garbage Wagons.
Austin-Western Road Machy. Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
Studebaker Corporation.
Watson Wagon Co.
White Co., The

Gas Engines.
Bruce-Macbeth Engine Co.
Westinghouse Electric & Mfg. Co.
Worthington Pump & Mach. Corp

Gaskets.
Leadite Co.

Gas Meters.
General Electric Co.
Pittsburgh Meter Co.

Gasoline Pumping Engines.
Bond Co., Harold L.
Modern Iron Works
Worthington Pump & Mach. Corp.

Gasoline Storage Tanks.
Bowser & Co., Inc., S. F.

Gates For Parks and Cemeteri
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Company.
Wright Wire Co.

Gauges—Surface, Reservoir Special Water Works.
Clark Co., H. W.

Graders.
Adams & Co., J. D.
Austin-Western Road Machy.
Baker Mfg. Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Graphite.
Dixon Crucible Co., Joseph

Grass Seed.
Burpee Co., W. Atlee
Dreer, Henry A.
Thorburn & Co., J. M.

Health and Amusement Devic
American Playground Device C
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Noll Bros.

Hitching Posts.
Barnum Iron & Wire Works, E
Casey-Hedges Co.

Holophane Refractors
Holophane Glass Co., Inc.

Hose.
Anderson Coupling & Fire Sup
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

Hot Mixers.
Barber Asphalt Paving Co.

House Numbers.
Baltimore Enamel & Novelty

Hydrants
Clow & Sons, James B.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Mfg. Co.
Norwood Engineering Co.
Pratt & Cady Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co
Wood & Co., R. D.

Indicator Posts.
Columbian Iron Works.
Flower-Stephens Mfg. Co.
Ludlow Valve Mfg. Co.
Pratt & Cady, Inc.
Rensselaer Valve Co.

Insulating Materials.
Bissell Co., F.
Carey Co., Philip.
General Electric Co.
Westinghouse Electric & Mfg.

Insulated Wire and Cable.
Bissell Co., F.
General Electric Co.
Simplex Wire & Cable Co.

Iron Collapsible Forms For M ing Concrete.
Clark Co., H. W.
Ford Meter Box Co.

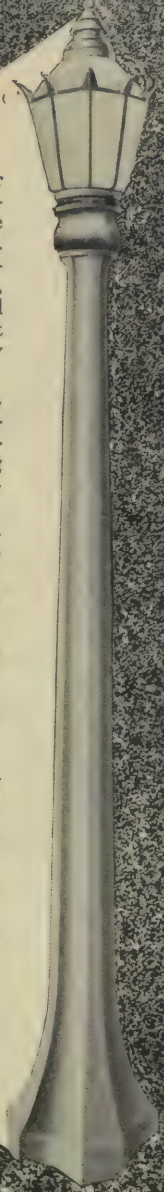
Jail Cells and Jail Work.
Barnum Iron Works, E. T.

Joints, Flexible.
Coldwell-Wilcox Co.

Kahn Armour Plates.
Trussed Concrete Steel Co.

Continued on page 92

THE NATION'S GUARDIAN
THE CITY'S GUARDIAN



Cutter Flood-Lighting Projectors are national safeguards. They afford ample protection to public buildings, bridges, warehouses and all other structures which are subject to the villainies of spies and enemy sympathizers.

These Projectors flood large areas with a powerful illumination of daylight quality, making it difficult for the "foreign emissary" to perform his knavish work. These Projectors are being used extensively thruout the country. Are YOU protecting YOUR city?

Cutter Ornamental Lighting Standards are municipal guardians. The people of a poorly lighted city are always in danger of becoming victims of crime, accidents and other evils. Cutter Lighting Systems are helping to safeguard the people in scores of places. Are YOU protecting YOUR citizens?

Cutter standards possess another feature. They are pleasing to the eye and will greatly improve the appearance of your business and residential streets, parks and boulevards.

Write for our illustrated catalog, it is free to those interested in modern and better lighting.

George Cutter Company

413 Notre Dame St., So. Bend, Ind.

CHICAGO DETROIT
NEW YORK LOS ANGELES
SAN FRANCISCO
SEATTLE

CUTTER

"Stop Burning Coal to Waste Water

THAT using high-priced labor and coal to pump water to waste is criminal should be apparent even to blind city officials after a general coal famine in zero weather, with snow and ice blockades. Efficient measures to stop this joint waste of water, coal, labor and money, with its constant threat to property and life here and its drag on the war abroad, should be adopted by all sinning towns and cities as a part of their municipal war programs."

(*Editorial in Eng. News-Record*, 2/21/18)

DOES THIS MEAN YOU?

There is only one way to be sure.

A PITOMETER SURVEY

will locate *all* leaks and enable you to stop *all* waste.

It will tell you what percentage of your daily consumption is being wasted.

It will locate all underground losses.

It will increase the efficiency of your house-to-house inspections.

It will point out where actual revenue is being lost by under-registration of meters.

It will effect a saving amounting to thousands of dollars annually.

The incentive to stop waste has never been greater than at the present time.

Everyone interested in reducing water department expenses and losses to a minimum should write for our booklets about "water waste and how to stop it."

The Pitometer Co. 55 Duane St., New York

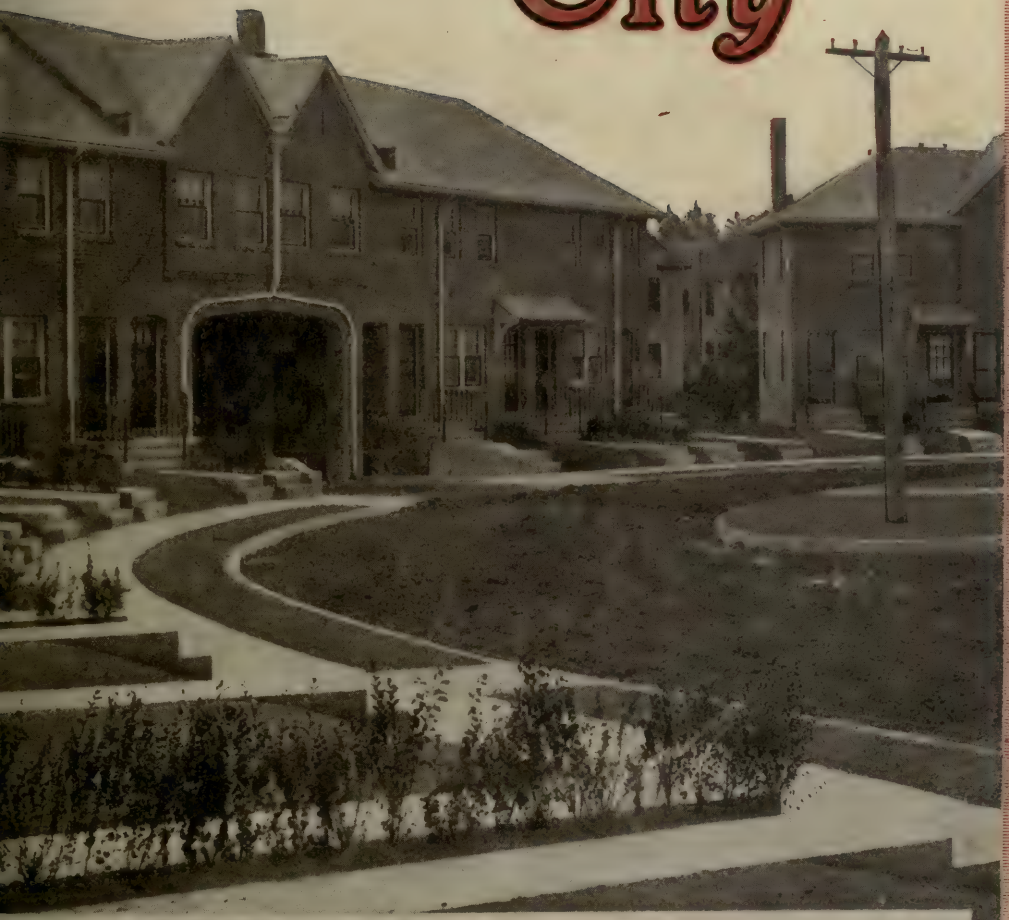
EBRUARY, 1918

s $3 a Year

Publication Office
Tribune Building
New York

PHILLIPS UNIVERSITY LIBRARY

The American City



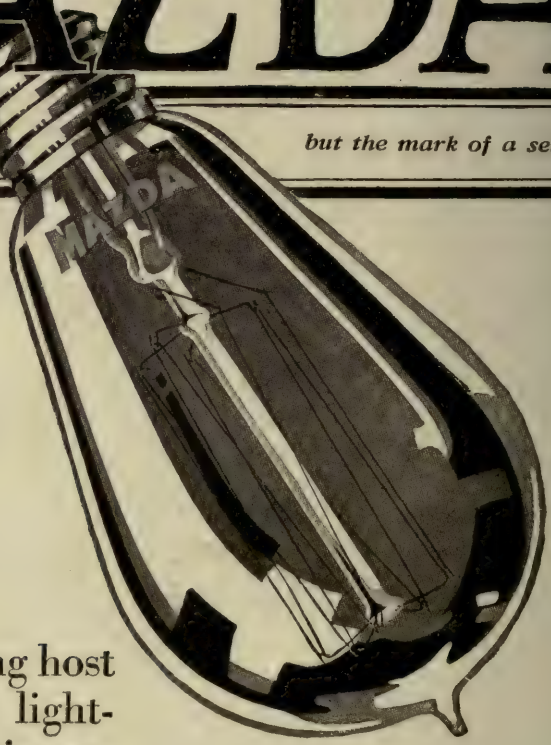
THE BUILDING OF WORKMEN'S HOMES ONE OF AMERICA'S MOST URGENT WAR PROBLEMS

Under the present conditions of house shortage and congestion in the United States, the building homes for workmen "becomes a governmental function and should be treated as a pure war ergency and at the present moment the most necessary thing to be done to win the war . . . ry day's delay is fraught with the utmost danger."

—From the resolution adopted December 14, 1917, by the Board of Directors of the Chamber of Commerce, of the United States.

MAZDA

"Not the name of a thing, but the mark of a service



From the incoming host of new ideas on lighting, MAZDA Service selects for the makers of MAZDA Lamps, only those developments in design, materials and methods that will improve the light you enjoy

The Meaning of MAZDA

MAZDA is the trademark of a world-wide service to certain lamp manufacturers. Its purpose is to collect and select scientific and practical information concerning progress and developments in the art of incandescent lamp manufacturing and to distribute this information to the companies entitled to receive this Service.

MAZDA Service is centered in the Research Laboratories of t General Electric Company at Schenectady, New York. T mark MAZDA can appear only on lamps which meet the standar of MAZDA Service. It is thus an assurance of quality. T trademark is the property of the General Electric Company.

RESEARCH LABORATORIES OF GENERAL ELECTRIC COMPAN

46

United States Cast Iron Pipe and Foundry Co.

At Your Service

The large capacity and favorable location of our several foundries enable us to offer prompt shipment of even the largest orders for

U. S. CAST IRON PIPE

Nature herself having provided the qualities which make Cast Iron Pipe

"The Pipe That Outlasts The Ages"

REMEMBER

Wood rots, tile and cement disintegrate and steel corrodes, but Cast Iron Pipe Culverts defy time, the elements and superimposed loads.

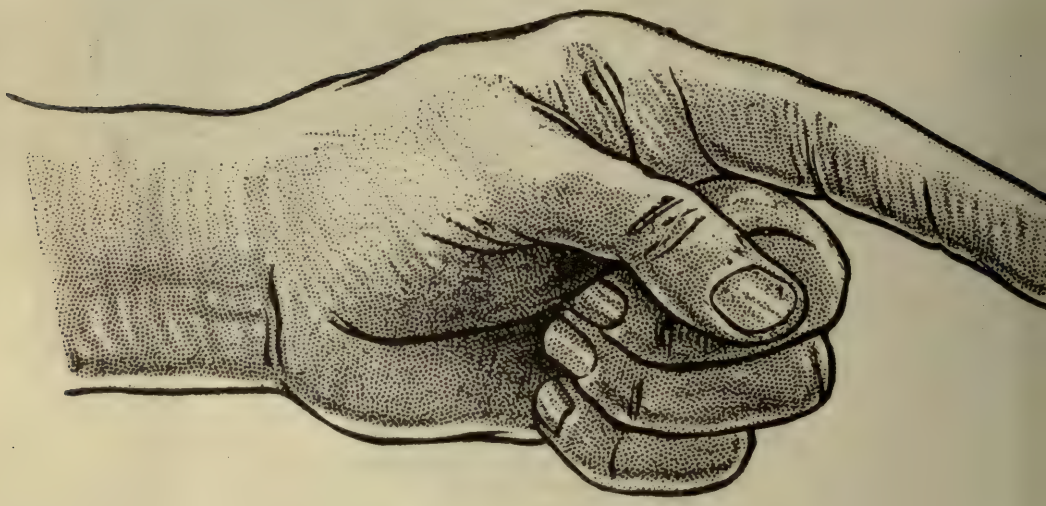
UNITED STATES CAST IRON PIPE AND FOUNDRY COMPANY

700 E. Pearl St., BURLINGTON, N. J.

SALES OFFICES

Philadelphia.....1421 Chestnut Street
New York.....71 Broadway
Pittsburgh.....Henry W. Oliver Bldg.
Chicago.....122 S. Michigan Blvd.
St. Louis.....Security Bldg
Birmingham, Ala.....American Trust Building
San Francisco.....Monadnock Bldg.
Buffalo, N. Y.....957 E. Ferry Street

For Index to Advertisements see Page 100
For Classified List of Advertisers see Page 90



Don't Forget

Elastite
would have prevented
this.

Build your walks so they will not crack

CRACKS are the bane of sidewalk beauty. They let water through to undermine foundations and cause the walk to sag. They are always the first point of decay and disruption.

CAREY

Elastite

Reg. U.S. Patent Office

EXPANSION JOINT

prevents all unsightly cracks and protects real estate values.

Elastite strips are inserted at specified intervals in pavements of concrete, granite, brick or wood block. They *absorb* all natural expansion and contraction caused by changes of temperature.

Elastite is made of asphalt compressed between asphalt felt faces. It is uniform in thickness, comes in any length ordered, is inexpensive to buy, easy to lay, has lasting resilience and wears like iron.

Carey Elastite is used in many of the most important highways of America, including Dixie, Lincoln, and others.

Write for samples, prices, and engineering testimony as to good results proved in notable installations.

THE PHILIP CAREY COMPANY
8 Wayne Ave., Lockland, Cincinnati, O.

Announcement

THE sixth annual edition of "Motor Trucks of America" is now ready for distribution.

Prepared in response to a demand from business men for authentic information regarding motor trucks. This is a hand-book of over 200 pages, containing photographs, prices and detailed specifications, conveniently arranged for comparison.

"Motor Trucks of America" is accepted in the industry as the one authentic survey of trucks made in the United States.

Never before has the commercial demand for motor trucks been so insistent. Moreover, the United States Government is purchasing thousands of motor trucks for use in the war. Hence it is becoming increasingly difficult to secure immediate deliveries.

If you are unable to obtain any desired make, "Motor Trucks of America" will help you to survey the field and thus select the truck which most nearly meets your requirements, without going into the open market.

We will without charge, send copies to responsible applicants, if requested on business letter-head.

Truck Tire Department

THE B.F.GOODRICH RUBBER COMPANY

AKRON, OHIO—The City of Goodrich

GOODRICH FIRE HOSE

Co-operates With You, Mr. Fire Chief—

You wouldn't want a man on your force that was continually showing the white feather every time you ordered him to perform some dangerous task at a big fire. Neither do you want a hose that won't co-operate with you when every ounce of pressure is needed to break the back of that big blaze.

"WHITE KING"

is proving itself every day all over the land. You will travel an endless road if you start out to search for anything better. Your community cannot invest in securities that will yield bigger returns than this dependable fire hose.

Used Today by the Fire Chiefs of our Biggest Cities
Write Us and We Will Tell You Where and Why

THE B.F. GOODRICH RUBBER COMPANY

Makers of the Celebrated Goodrich Automobile Tires—*"Best in the Long Run"*

AKRON, OHIO **Representation Everywhere**

BROAD STREET, PHILADELPHIA, WHERE CAST IRON PIPE WAS LAID 100 YEARS AGO

Interesting Comparisons

Which Indicate That for Long Service Nothing Can Equal

Cast Iron Pipe

BACK in 1817, by way of experiment, 400 feet of Cast Iron Pipe were laid by the "Watering Committee" of the City of Philadelphia. Ninety-eight years later, for no reason except lack of capacity, that pipe was disconnected.

Not only during this entire time that pipe never gave any trouble, but, so far as the material in the pipe was concerned, it was unquestionably good for several centuries of service.

Ninety-eight years of service seems short as compared to the two and a half centuries of service which Cast Iron Pipe has given at Versailles, France. Bear in mind, however, that France is the older Republic and that the Service of Cast Iron Pipe can only be measured by centuries.

Has America heeded the lesson of that "experiment" of the "*Watering Committee*"; let the facts given here be your answer.

THE FIRST CAST IRON PIPE EVER MADE IN THE WORLDS HISTORY IS STILL IN SERVICE
SERVICE
CAST IRON PIPE
MEASURED BY
CAST IRON PIPE
CENTURIES
MORE THAN 250 YEARS OLD

The Total Mileage of Cast Iron Pipe

in service at New York, Chicago, Philadelphia, Boston, Baltimore and Minneapolis

equals 4 times the distance between New York and Rome, Italy.

The Total Mileage of Cast Iron Pipe

in service at New York

equals the distance from Buffalo to Rio de Janeiro.

The Total Mileage of Cast Iron Pipe

in service at Chicago

equals the distance from Oklahoma to London, England.

The Total Mileage of Cast Iron Pipe

in service at Philadelphia

equals the distance from San Francisco to Tampa.

The Total Mileage of Cast Iron Pipe

in service at Boston

equals the distance from New York to Denver.

The Total Mileage of Cast Iron Pipe

in service at Baltimore

equals the distance from Philadelphia to Aberdeen, South Dakota.

The Total Mileage of Cast Iron Pipe

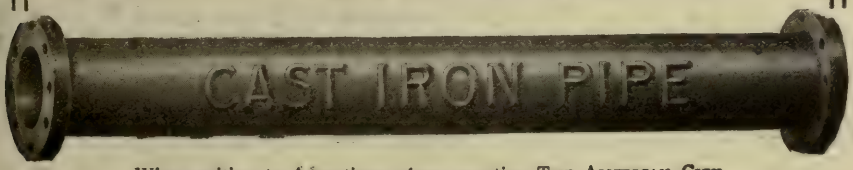
in service at Minneapolis

equals the distance from Minneapolis to Atlanta.

Such is the record of Cast Iron Pipe speaking Geographically, but remember while the mileage of Cast Iron Pipe can be measured by man, its service can be measured only by centuries.

The Cast Iron Pipe Publicity Bureau

1 Broadway, New York

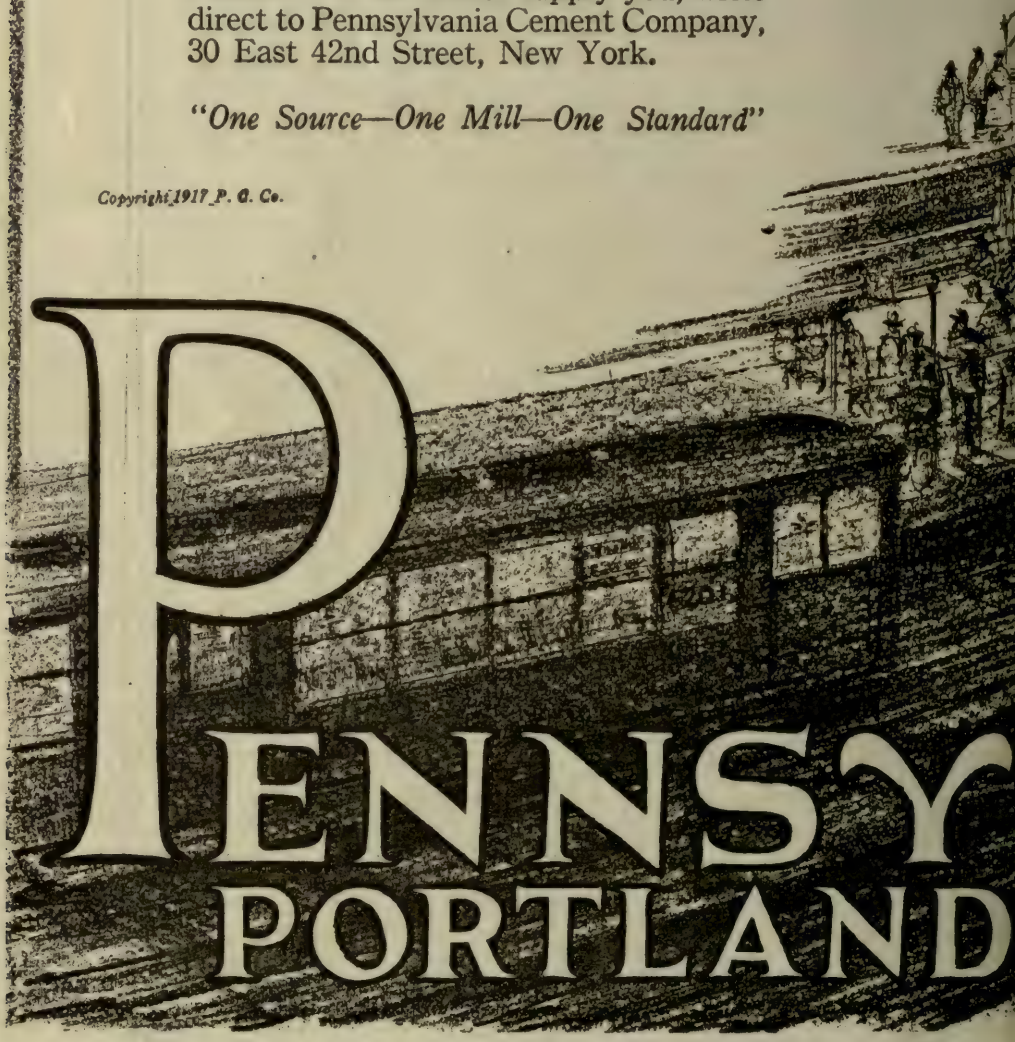


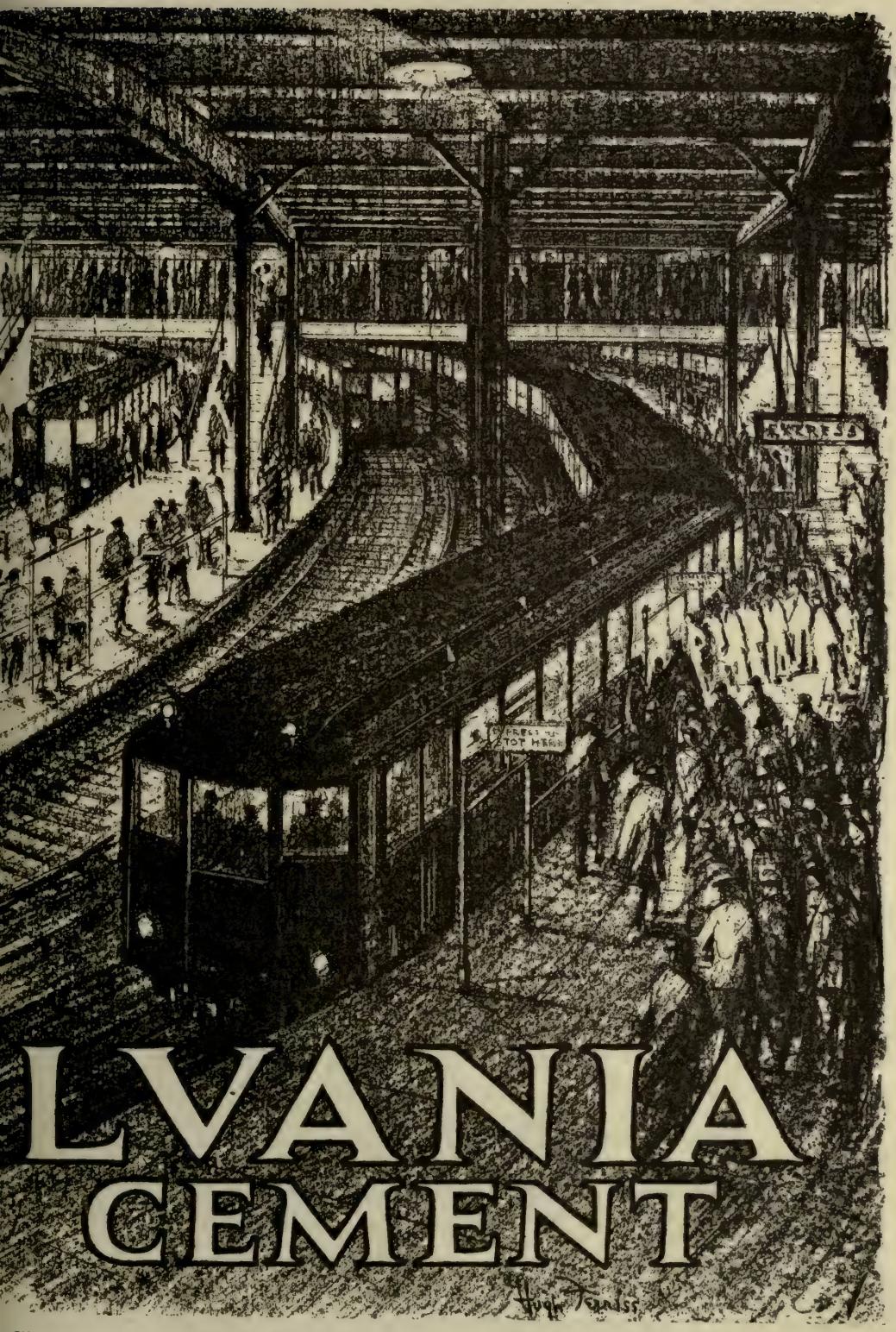
THE SUBWAY, NEW YORK CITY

Two million barrels of Pennsylvania Cement (in round figures) were used in the construction of the New York and Brooklyn Subways. Over 90% of our production is used in construction that calls for the highest tests. Every bag and barrel of Pennsylvania, wherever bought for whatever purpose, is made to the same standard. Ask your dealer for Pennsylvania Cement. If he cannot supply you, write direct to Pennsylvania Cement Company, 30 East 42nd Street, New York.

"One Source—One Mill—One Standard"

Copyright 1917 P. C. Co.



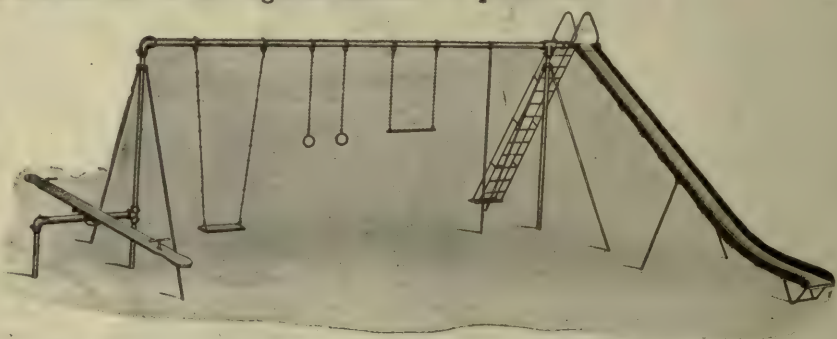

EXPRESS
LVANIA
CEMENT

EVERWEAR
STANDS WEAR AND TEAR

Swing as High as You Like

The children are safe on EVERWEAR swings. They are built with an eye single to safety.

An all-steel galvanized product throughout, specially designed for the wear and tear of outdoor use. All detail of bearings, connections, etc., have been worked out to the highest standard of perfection.



COMBINATION OUTFIT, No. E-125. 8 ft. high, 20 ft. long.

EVERWEAR outfits are equipped with malleable frame fittings and drop forged steel parts for bearings. Combinations of apparatus furnished to suit any locality or condition. Advise us of your ground space, water, shading, etc., and we will be pleased to furnish you plans and prices gratis. Our services are yours for the asking.

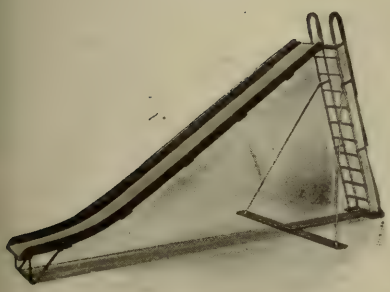
A full line of the latest and approved playground apparatus shown in Catalog E-8 which will be sent on request.

THE EVERWEAR MFG. CO.

Springfield, Ohio

EVERWEAR
STANDS WEAR AND TEAR

The Old Cellar Door Commercialized



If there is any one piece of playground apparatus that the child likes more than another, that outfit is the slide chute. This is the most popular outfit of all in the minds of the children, and just keep your eye on the "grown-ups" for a slide on the sly.

The bedways of Everwear Chutes are lined with either clear rock maple or heavy galvanized sheet metal—as you elect—the price being the same. The all-steel step approach is equipped with malleable TREAD STEPS and all metal parts are galvanized throughout.

We furnish them in all lengths from the 8-foot Kindergarten length to the 30-foot length for public playgrounds.

Catalog E-8 showing a full line of the latest and approved playground equipment will be sent on request. Send in coupon below.

The Everwear Mfg. Co.
SPRINGFIELD, OHIO

GENTLEMEN:

Please send me without cost, a copy of your Catalog E-8, showing a full line of the latest and approved playground equipment.

Name.....

Address.....

Am. City

When you do install water meters to save that unnecessary burning of fuel you cannot well afford to select any but the best meter—that is to say the meter which renders the most reliable service in the long run.

The fact that TR DENT METERS a the most wide used in spite of t fact that they a somewhat higher price, indicates th Tridents have pro en the most ec nomical when se vice as well as fir cost are considere

NEPTUNE METER COMPANY

50 EAST 42nd STREET, NEW YORK

CHICAGO · BOSTON · CINCINNATI · SANFRANCISCO
ATLANTA · LOS ANGELES · PORTLAND · SEATTLE

What the Government Expects

If the quantity of water used and wasted in each city of this country can be reduced by the co-operation of citizens and city officials, thousands of coal cars will be released for other purposes. If we all use less water that has to be pumped, we shall aid the hundreds of factories that are making supplies for the Army and Navy and which to-day are working on a half-time basis, or even shutting down for a week at a time because there is not enough coal at hand to run their machinery. This is a problem for serious consideration by all cities. The Government of the United States expects every city to do its duty by using less water and thereby conserving coal.

Our booklets on water waste prevention will be sent free of charge on receipt of your address.

NEPTUNE METER COMPANY

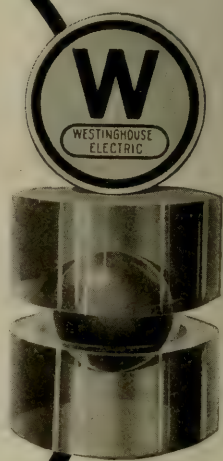
50 EAST 42nd STREET, NEW YORK

CHICAGO · BOSTON · CINCINNATI · SAN FRANCISCO
ATLANTA · LOS ANGELES · PORTLAND · SEATTLE

Westinghouse

Type OA Watthour Meters

give maximum accuracy because they embody certain distinctive features, one of which is—



The Double-Jewelled Ball Bearing

supporting the main shaft. This feature is largely responsible for the reputation for unequalled sustained accuracy which Type OA Watthour Meters enjoy.

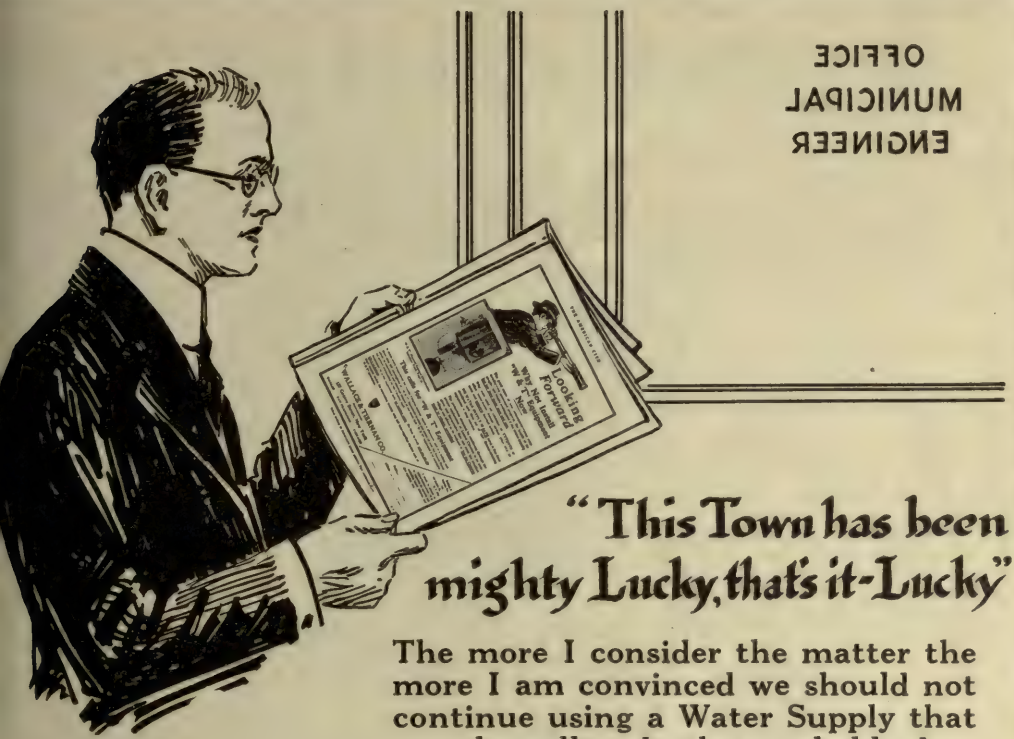
Westinghouse Type OA Watthour Meters are fully described in our Catalogue No. 3A.

Westinghouse Electric & Mfg. Company

East Pittsburgh, Pa.

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Bluefield, W. Va.
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chattanooga, Tenn.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Columbus, Ohio
*Dallas, Texas
Dayton, Ohio
Denver, Colo.
Des Moines, Iowa
Detroit, Mich.
Duluth, Mich.
*El Paso, Texas
*Houston, Texas
Indianapolis, Ind.
Joplin, Mo.
Kansas City, Mo.
Louisville, Ky.
Los Angeles, Cal.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
New Orleans, La.
New York, N. Y.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah
San Francisco, Cal.
Seattle, Wash.
Syracuse, N. Y.
Toledo, Ohio
Washington, D. C.
Wilkes-Barre, Pa.

*W. E. & M. Co. of Texas.



"This Town has been mighty Lucky, that's it-Lucky"

The more I consider the matter the more I am convinced we should not continue using a Water Supply that may be polluted—that probably does contain disease-creating organisms.

The Water must be Sterilized

—made pure and safe

Liquid Chlorine for this,—and to apply and control it properly,

"W & T" Apparatus

Because "W. & T." Equipment is equally well suited to any size City or Town; it is accurate and insures absolutely reliable control of the Chlorine; it is low in first cost, almost runs itself, and is a permanent investment.

If you are responsible in any degree for the health of *your* community—send Coupon for Booklet and full particulars *NOW*.

WALLACE & TIERNAN CO.
INCORPORATED
137 Centre Street, New York
San Francisco Chicago

Wallace & Tiernan Co., Inc.
137 Centre St., N. Y. City.

I would be pleased to receive booklet about "W & T" Apparatus for applying and controlling Liquid Chlorine, and data regarding cost and nearest installation.

Name.....
Address.....
.....
.....

A. C. 2-18

The Meter that gives absolute satisfaction is the BADGER

THE BADGER

Gives Most Service and Least Trouble

The water meter that will keep accurate records and give the most service with little trouble and maintenance expense is the Badger Meter.

Perfect workmanship and excellent finish are characteristic of all Badger Meters.

Every Badger Meter is carefully tested by actual operation before it is sent forth with our binding guarantee for accuracy.

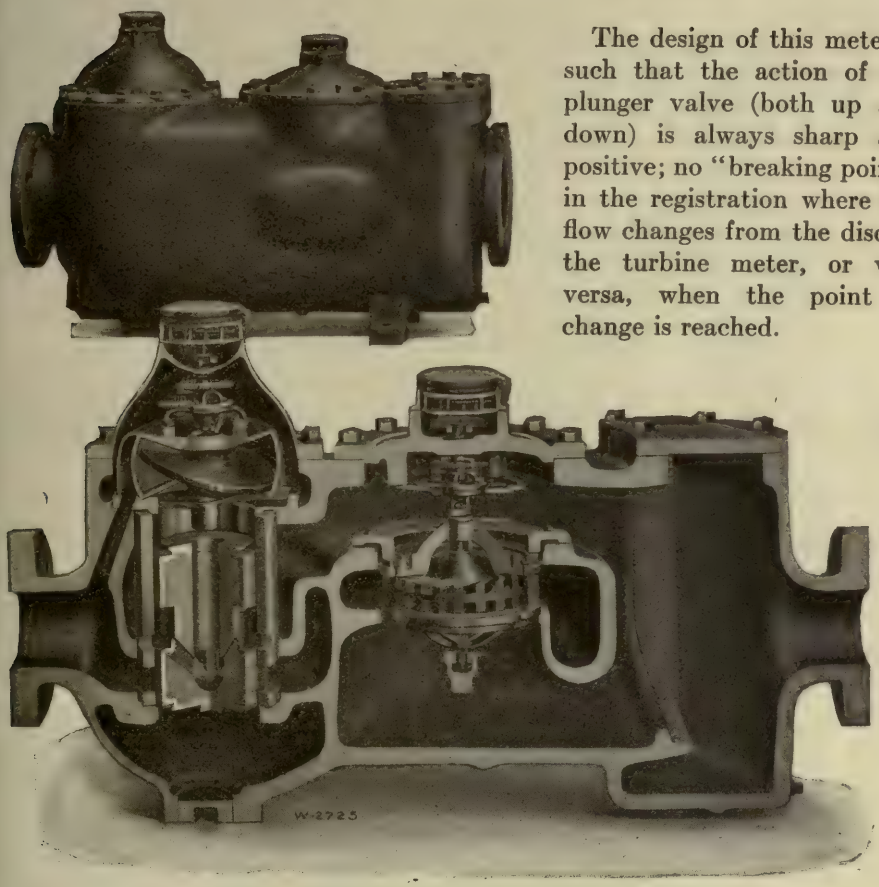
No test is considered satisfactory until the meter has properly recorded on both large and small flows.

Upon receipt of your name and address, a neat little booklet on water meters will be sent you free.

The Badger Meter Mfg. Co.
MILWAUKEE, WIS.

WORTHINGTON

COMPOUND METER



The design of this meter is such that the action of the plunger valve (both up and down) is always sharp and positive; no "breaking point" in the registration where the flow changes from the disc to the turbine meter, or vice versa, when the point of change is reached.

Send for Catalog W809-72

WORTHINGTON PUMP AND MACHINERY CORPORATION

New York Office: 115 Broadway

Works: Harrison, N. J.

Branch Offices in all Principal Cities

W369.8

Vitrified Clay Pipe

"THE PERMANENT PIPE"

The Safety Valve of Paved Highways

Drainage means as much to the pavement as a safety valve does to a steam boiler. Where either is omitted, destruction is swift and sure.

Frost is responsible for most ruined pavements. Its explosive action is silent but none the less sure, heaving, cracking, wrecking.

Even in warm weather, water in the sub-bed means the destruction of pavements, by uneven settling and by increased wear from normal traffic.

Vitrified Clay Pipe excels for every drainage purpose, including culverts. It lasts because it is hard and impervious, beside being immune to acids or electrolysis.

Abolish the dangerous, unsightly and inefficient side ditch. Drain with Vitrified Clay Pipe. The investment is much more than realized in the added life of the pavement.

THE SEWER PIPE MANUFACTURERS ASSOCIATION

JOHN L. RICE
FIELD COMMISSIONER

SECOND NATIONAL BL
AKRON, OHIO

—there's nothing like CAST IRON SOIL PIPE for all House Drainage

ONLY—PERMANENT SERVICE

IN THE BUILDING
UNDER THE GROUND

Removing a Menace!

Look at the picture and see why —

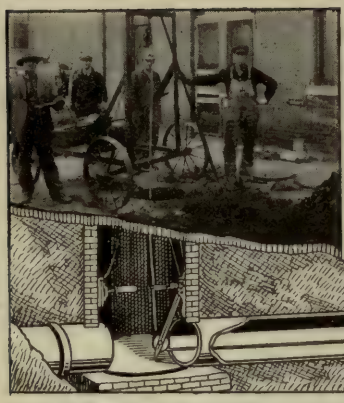
HOMES HAVE BEEN RENDERED UNFIT FOR HUMAN HABITATION AND MILLIONS OF DOLLARS HAVE BEEN WASTED BY SUBSTITUTING OTHER PIPE FOR CAST IRON SOIL PIPE.

USE SOIL PIPE WHERE SOIL PIPE SHOULD BE USED

A1038

ard literature will be
equest
of the following
nd competing makers
Soil Pipe

dry Co.
Anniston, Ala
Co.,
Bessemer, Ala.
r Co.,
Anniston, Ala.
on Co., A.
Baltimore, Md
o., H.
Memphis, Tenn
thers.
rt Chester, N Y.
& Foundry Co.,
Anniston, Ala
ndry & Pipe Co.
enns Station, Pa
dry Co.
Anniston, Ala
Pipe Co.
Bessemer, Ala
Co.,
Gadsden, Ala
Co., The,
ttanooga, Tenn
ry Co.,
New York, N. Y
& Foundry Co.
Charlotte, N. C
Foundry Co.,
irmingham, Ala
Foundry Co.,
Jackson, Ohio
Co.,
Gadsden, Ala
& Cadbury Co
Philadelphia, Pa
D.
ew York, N. Y
Co.
Lansdale, Pa
y Co.,
Medina, N. Y
ry Co. of N.Y.,
Brooklyn, N. Y
Foundry Co.,
Attalla, Ala.
y & Supply Co.,
Reading, Pa
ron Mfg. Co.,
Salem, N. J
ny of America,
Linfield, Pa
Works,
ew York, N Y



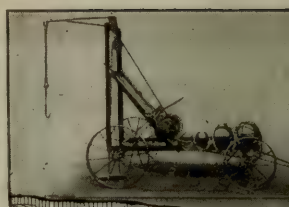
SEWER CLEANING MACHINERY

The Kuhlman Sewer Cleaning Apparatus will clear any sewer of dirt, gravel, sand, cinders, rags, paper, tar or practically anything.

It does the work quickly and cheaply. It's a great time and money saver. It is being utilized by scores of progressive municipalities all over the country.

Write at once for prices and other interesting information. We also make sewer rods. Send for free sample.

The Champion Potato Machinery Co.
338 Sheffield Ave. Hammond, Ind.



AMERICAN CAST IRON PIPE CO

MANUFACTURERS OF CAST IRON PIPE & FITTINGS BIRMINGHAM ALA.

SALES OFFICES
Birmingham, Ala., Box 908
Columbus, Ohio, 607 New Hayden Bldg.
Minneapolis, Minn., 712 Plymouth Bldg.
New York City, No. 1 Broadway
Chicago, Ill., 512 1st National Bank Bldg
Dallas, Tex., 1217 Praetorian Bldg.
Kansas City, Mo., 716 Scarritt Bldg.
San Francisco, Cal., 711 Balboa Bldg.

LYNCHBURG FOUNDRY COMPANY

CAST IRON PIPE AND FITTINGS Bell and Spigot and Flanged

GENERAL SALES OFFICE: Peoples Gas Building, CHICAGO, ILL.

MATHIESON ALKALI WORKS, Inc.

Niagara Falls, N. Y.

Castner Electrolytic Process

Eagle-Thistle Brand

CHLORIDE OF LIME

In 200, 450 and 750-lb. drums
Strongest, quickest-settling, most reliable.

LIQUID CHLORINE

Pure anhydrous, for use with any control apparatus. In improved and convenient cylinders, 105 and 150 lbs. net.

ARNOLD, HOFFMAN & CO., Inc.

Sole Agents

Boston, Providence — 61 Broadway, New York — Philadelphia, Charlotte, N. C.

APPROVAL

HERSEY DETECTOR METER

The Hersey Detector Meter has been accepted for eleven years in 3, 4, 6, 8, 10 and 12" sizes without any restrictions or conditions of any kind by every Insurance Company Stock and Mutual, doing business in the United States, and by the Water Departments and Water Companies in more than 500 Cities and Towns for use on over 3,000 Fire Services protecting nearly $2,000,000,000 worth of Insured Property

HERSEY MANUFACTURING COMPANY

BOSTON, NEW YORK, CHICAGO — COLUMBUS, O., PHILADELPHIA, ATLANTA — SAN FRANCISCO, LOS ANGELES, PORTLAND, ORE.

The Pipe that Answers All Questions

STANDARD SIX FOOT LENGTHS LAID WITHOUT CALKING OR GASKETS.

BECAUSE——

That is why it is used for—

WATER
GAS
SEWAGE DISPOSAL
SUCTION
OIL DISTILLATION
REFRIGERATION
LOW-PRESSURE STEAM
CENTRAL STATION HEATING
DYE AND ACID DRAINS

-and all other classes of service—in buildings—under ground.

CAST IRON PIPE is the pipe of long life—THE PIPE EVERLASTING.

CAST IRON PIPE with the UNIVERSAL JOINT STAYS when other pipe and other joints leak.

Tested and approved for Fire Protection Service by the National Board of Fire Underwriters.

Wrenches the Only Equipment

—no packing
—no calking
—no gaskets

UNIVERSAL PIPE can be laid anywhere—at any time—under any conditions.

CORRESPONDENCE INVITED.

CENTRAL FOUNDRY COMPANY

CHICAGO
DALLAS

NEW YORK
90 West Street

ATLANTA
SAN FRANCISCO

U-246

DRY FEED
for
COAGULANT
application in
Filter Plants

Economizes space, Labor, Installation cost; Increases efficiency.

PITTSBURGH FILTER MFG. CO.

Kansas City, Mo. Pittsburgh, Pa.

The MANOGRAPH

The Standard of Accuracy

The MANOGRAPH gives a 24-hour chart record of Pumping Station discharge or delivery of water by gravity.

This instrument is a tell tale of pump efficiency. Pump slip may be eliminated when accurate measurement is made of the discharge.

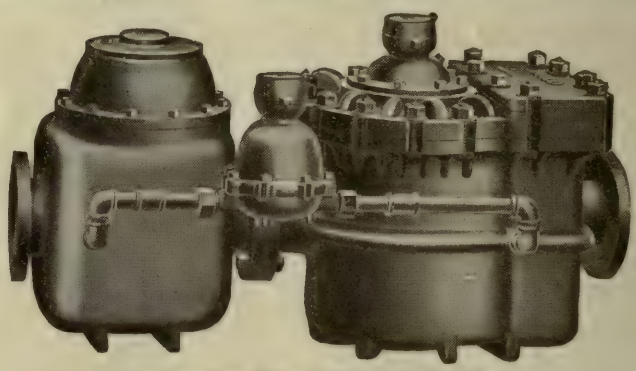
The time and duration of abnormal draughts are indicated together with many other features of value to Water Works Operators.

A booklet, descriptive of the MANOGRAPH, will be mailed upon request.

Our new catalog is ready for distribution. Send for your copy.

WATER WORKS EQUIPMENT CO.

50 Church Street, New York



Compounding Valve Attached to Nilo Meter

The Union Compounding Valve Makes it Possible for any Large Meter to Register the Trickle as well as the Rush.

Simply take the valve and the small meter and attach them to the large meter, and you have an accurate and simple compound meter at a remarkably low cost.

Write for further information.

UNION WATER METER CO.

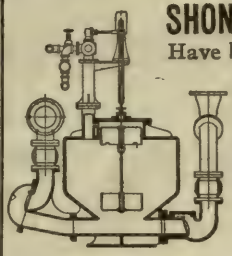
WORCESTER, MASS

TRADE MINWAX MARK

THE PERMANENT
WATERPROOFING

Used on notable municipal works the country over. Send for the "Minwax" Bulletins describing waterproofing and protective products for every purpose.

THE MINWAX COMPANY, Inc.
18 EAST 41st STREET NEW YORK



SHONE SEWAGE EJECTORS

Have been used for pumping city sewage in all parts of the world for over 35 years.

Unequalled for reliability, economy and durability.

Automatic and odorless.

Send for Bulletin P 4000

SHONE COMPANY
231 Institute Place, CHICAGO

Manufacturers of CAST IRON PIPE

for WATER—GAS—CULVERTS—SEWERS

Special Castings:-Also Flexible Joint Pipe-Cylinders-Tubes, Milled and Plain Ends-High Pressure Fire Service Pipe.

"Quality and Service Guaranteed"

WARREN FOUNDRY & MACHINE CO

Sales Offices: 11 Broadway, N.Y. 201 Devonshire St., Boston, Mass.
Works: Phillipsburg, N. J.

MICHIGAN
PRODUCTS

Fire Hydrants
Gate Valves
Sluice Gates
Check Valves
Foot Valves
Shear Valves
Tide Valves
Sleeve Valves
Tapping Machines
Indicator Posts
Valve Boxes

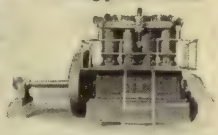
FLOWER-STEPHENS MANUFACTURING COMPANY
103 Parkinson Street, Detroit, Mich.

NEW YORK CHICAGO
Keystone and Eureka
Water Meters
Pittsburgh Meter Co.
East Pittsburgh, Pa.
LOS ANGELES SEATTLE
COLUMBIA, S.C. KANSAS CITY

CONSERVE YOUR FUEL

The conservation of fuel is now more than an economic advantage—it is an essential factor in meeting present national and industrial requirements.

GAS POWER is universally recognized as the cheapest form of power available, as well as the best for many kinds of service.



Bruce-Macbeth gas power plants operate on either gas or coal.

THE BRUCE-MACBETH ENGINE COMPANY
2137 Centre St., N. W., Cleveland

BRUCE-MACBETH GAS ENGINES

P&C CO

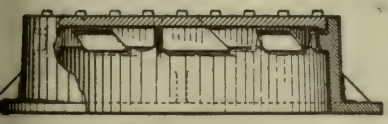
Water Gates & Fire Hydrants

P&C CO

BUILT FOR UTILITY AND DURABILITY

Write for Booklet

PRATT & CADY CO., INC. HARTFORD, CONN.



WM. E. DEE COMPANY
80 N. La Salle Street Chicago, Ill.

We manufacture Manhole, Catch Basin and Sewerage Castings of all Kinds. We make anything in Gray Iron. Write for our prices.

FILTROS—UNIFORMLY POROUS PLATES

ARE USED FOR THE AIR DIFFUSION IN PRACTICALLY ALL OF THE ACTIVATED SLUDGE PLANTS OPERATING IN THE UNITED STATES. BOOKLET DESCRIPTIVE OF FILTROS IS SUPPLIED UPON REQUEST.

GENERAL FILTRATION COMPANY, Inc.
CUTLER BUILDING **ROCHESTER, N. Y.**

SLUICE GATES, CHECK VALVES, AIR VALVES, INDICATOR POSTS, ETC.

GATE VALVES **EDDY** **FIRE HYDRANTS**

Hydraulically and Electrically Operated Valves and Sluice Gates. Valves Designed For All Kinds of Service.

EDDY VALVE COMPANY, WATERFORD, N. Y.

New York Chicago Boston San Francisco Philadelphia

COLUMBIAN IRON WORKS

CHATTANOOGA, TENN.

Manufacturers of Fire Hydrants, Valves, Valve Boxes, Sluice Gates, Meter Boxes and Water Works Supplies

ESTIMATES PROMPTLY FURNISHED

Trade **LEADITE** *Mark*

Registered U. S. Patent Office

For Jointing Cast Iron Water Mains

NO CAULKING required

Saves 50% to 65%

Write for information and price

THE LEADITE COMPANY, Inc.

100 S. Broad Street Philadelphia, Pa.

SECURITY SEWER RODS

Send for Flyer No. 30

They cannot buckle or uncouple in the duct

Security Rods are made from second growth hickory, with malleable iron couplings swedged or shrunk down very tightly on to the curved places at end of sticks. Security couplings cannot come off.

Joint and unjoint easily and quickly—light weight—long runs easily made. No slack but lend themselves to all practical bends

Three-foot Rods, 65 cents each
Four-foot Rods, 75 cents each

F. BISSELL COMPANY, 226-228-230 Huron Street Toledo, Ohio

FIRE HYDRANTS

Frost-Proof
Simple-Efficient

All parts removable without digging up hydrant. Special device prevents street from being flooded should stand pipe be broken Minimum expense to install and maintain.

LUDLOW GATE VALVES

FOR

Water, Steam Gas, Oil, Hydraulic or Electric Operated

All styles, any size, all pressures

- - THE - -

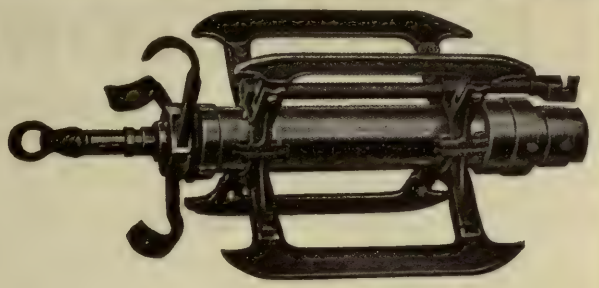
Ludlow Valve Mfg. Co.

TROY, N. Y.

Branch Offices

New York Chicago Boston Philadelphia Pittsburg Kansas City

The Turbine Cleans Any Size Sewer



The Turbine Sewer Machine will clean all sizes of sewers, from six to thirty inches in diameter. It frees a sewer from dirt, rags, cinders and other refuse, at an extremely low cost. Let us give you a demonstration of what this machine can do.

Saves labor, and time, and money. Write for full particulars.

Turbine Sewer Machine Co., 197 Eleventh St. **Milwaukee, Wis.**

"Let those now love who've never loved before,
And those who always loved now love the more."

LAMBERT WATER METERS

Long Life.

Lasting Accuracy.

All parts interchangeable.

Maintenance cost nominal.

Their merits have made meter systems popular. A good article is always worth the price. All improvements which the tests of time and long service show to be requisite in a **Perfect Water Meter** are embodied in the **Lambert.**

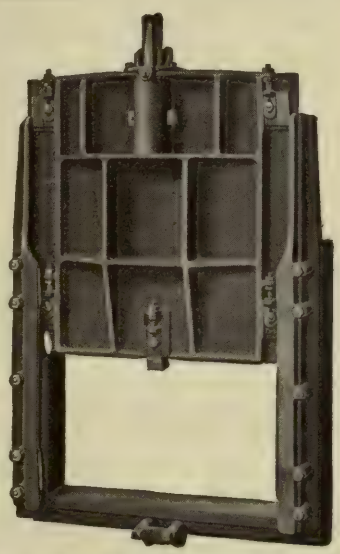
ONE MODEL ONLY

Made in all sizes, 5/8" to 6", of best bronze Composition throughout, fitted with Unbreakable reinforced disc-pistons.

Illustrated Price List on Application. Address Dept. C.

THOMSON METER CO.

100-110 BRIDGE ST., BROOKLYN, N.Y.



Sluice, Head and Penstock Gates
Flap and Shear Valves

The kind that don't wear out

COLDWELL, WILCOX COMPANY

Water Street **Newburgh, N. Y.**

DEMING POWER PUMPS
For Municipal Service

The illustration represents the municipal pump house at Dickinson, N. D. A Deming Power Pump in this house, forces the water to an elevated tank, where it is constantly available for domestic needs and fire protection.

In hundreds of municipalities throughout the country, may be found pump houses like this with a Deming Power Pump or Deep Well Head inside. If your town is interested in pumping equipment, send for our 192-page Power Pump Catalogue "J." Municipal officials may have it on request.

THE DEMING COMPANY, Salem, Ohio

HAND AND POWER PUMPS FOR ALL USES

GENERAL DISTRIBUTING HOUSES:

Chicago: Henion & Hubbell.
Pittsburgh: Harris Pump & Supply Co.
New York: Ralph B. Carter Co.
Buffalo: Root, Neal & Co.
Boston: Chas. J. Jager Co.
Richmond: Sydnor Pump & Well Co.
Philadelphia: W. P. Dallett.
Denver: Hendrie & Bolthoff Mfg. & Sup. Co.
San Francisco: Simonds Machinery Co.
Charlotte, N. C.: Realty Building.
Houston, Tex.: H. A. Paine.
Agencies in all principal cities.

Buffalo Municipal Equipment Sewer Cleaning Machines

Different in Design—Durability—and Efficiency.

Sets clean any sewer from 6 inches upwards.

All deposits and tree roots removed simultaneously.

Now is the time to get facts.

Buffalo Municipal Equipment Company
Mutual Life Building Buffalo, N. Y.
Makers of flexible sewer rods and all kinds of sewer cleaning appurtenances.

Make Your Drinking Water SAFE
BY APPLYING

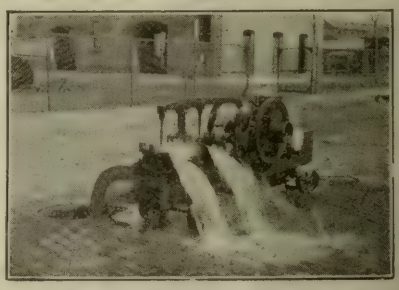
Liquid EBC Chlorine

For 2c. a year per capita you insure every man, woman and child in your town against the ravages of typhoid and other water-borne disease.

Write for free book—"THE WISE CITIES"—*It tells why.*

Electro Bleaching Gas Co., 16 E. 41st St., N. Y. C.

ATLANTIC PUMPING ENGINES



Se
f
19
Cat

HAROLD L. BOND COMPANY, 383 W. ATLANTIC A
BOSTON, MAS

Chemicals for Water Purification

We manufacture highest grade of

Sulphate of Alumina

also

Chloride of Lime

Liquid Chlorine

PENNSYLVANIA SALT MFG. CO.

115 CHESTNUT STREET :: PHILADELPHIA, PA.

R.D. Wood & Co.

PHILADELPHIA, U. S. A.

ENGINEERS
IRON FOUNDERS
MACHINISTS

Pipe, Hydrants, Valves, Gas Producers, Pumps, Gas Work Materials

Filtration Plants

for

Municipal Needs

Y. M. C. A's, Colleges and all Institutions

Write for Booklet

NORWOOD ENGINEERING CO.
Florence Mass.

GREAT WESTERN ELECTRO CHEM CO.
BUSH, BEACH & GENT
SOLE AGENTS
CARBON TETRACHLORIDE
POTASSIUM CHLORATE
BLEACHING POWDER
LIQUID CHLORINE
CAUSTIC SODA
SAN FRANCISCO, CAL.

A Contract is a Contract

80 Maiden Lane
NEW YORK

Holbrook Building
SAN FRANCISCO

LIQUID CHLORINE

CHLORIDE OF LIME
(Bleaching Powder)

—SODA ASH—

GRAVITY FILTERS PRESSURE
WATER SOFTENING PLANTS AND HYPOCHLORITE APPARATU
ALL VARIETIES OF CHEMICAL FEEDING DEVICE
Write for Bulletin 17-3
THE NEW YORK CONTINENTAL JEWELL FILTRATION CO
15 Broad Street, New York

"RENSSELAER" VALVES
All Sizes All Pressures All Purposes

"COREY" FIRE HYDRANTS
Valve Boxes Indicator Posts Air Valve

RENSSELAER VALVE CO.
General Offices, TROY, N. Y.
NEW YORK, Hudson Term. Bldg. CHICAGO, Monadnock Block PITTSBURGH, Oliver Bldg. SEATTLE, Arctic Bldg

The Best Material for CALKING Joints in Cast Iron Pipes is

Ulco Lead Wool

Write for particulars to

UNITED LEAD COMPANY
111 BROADWAY, N.Y. CITY

Meter, Roadway, Service and Valve Boxes

Municipal and Special Castings

ANYTHING for WATERWORKS

Write for Catalogue and Prices

MODERN IRON WORKS
510 Ohio Street Quincy, Illinois

Buffalo Saves $3,000 a Month in Fuel by Stopping Water Waste

The leaks in Buffalo's distribution system are being stopped by means of a *Pitometer Survey*, which makes it possible to reduce the daily consumption of water to a minimum. Up to date they have been able to locate and stop by its use over 180 underground leaks which could not be seen on the surface. The entire city of Buffalo is reaping the benefits—less coal, fewer chemicals and less of other necessary materials.

The saving effected in fuel alone amounts to nearly $3,000 per month already.

A PITOMETER SURVEY will pay for itself many times over in a remarkably short time.

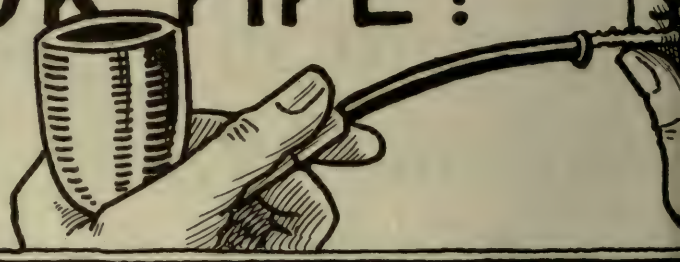
The small town, as well as the large city, will find its use beneficial.

Write us for detailed particulars at once.

THE PITOMETER COMPANY

55 Duane Street **New York City**

WHY DO YOU CLEAN YOUR PIPE?



After a limited amount of service, your pipe becomes clogged with bits of tobacco, etc., and becomes a nuisance instead of a comfort. When the pipe is in this condition what do you do? Do you buy a new one? No! You *clean* it, and it is like new once more.

The same principle applies to water mains. After a certain amount of service they too become "choked-up" with dirt and sediment. When in this condition, they retard the flow of water, which means more pressure. And more pressure means more coal and more coal means—well you know what more coal means. Why don't you clean your mains?

The National Method

will do this for you quickly and cheaply. Your mains are easily restored to normal service by proper cleansing. And it is so simple.

Write for detailed information. It shows how you can cut down your coal bills.

National Water Main Cleaning Co.

Hudson Terminal Building

NEW YORK CITY

WRITE FOR ITERATURE BELOW

WRITE FOR TRIAL METER

WATER METER RATES AND REGULATIONS
ADVANTAGES OF USING WATER METERS
MODEL WATER METER SPECIFICATIONS
FACTS AND FIGURES ABOUT OUR METERS IN SERVICE
AMERICAN AND NIAGARA WATER METERS
WATER METER ACCESSORIES
SETTING AND TESTING WATER METERS
PRICE LIST WATER METERS AND ACCESSORIES

ADJUSTABLE MANHOLE TOP

n Adjustable Manhole Top with a cover hich stays in place and does not Rattle.

pecially adapted to meet the strenu- is requirements of varying grade anges and surface wear—incident heavy and mixed traffic.

otwithstanding general shortage of aterials and difficulties of transporta- on. We can make PROMPT SHIP- ENTS.

rite us for detailed information.

E. T. VALVE & HYDRANT COMPANY
adson Terminal Bldg., New York City

PIVOT LOCK COVER

For Manholes Meter Boxes
Street Sweeping Receptacles

SAFE, ECONOMICAL and SANITARY
Write for details
THE EAST IRON AND MACHINE CO., Lima, O.

ORIGINAL

F COURSE WE HAVE IMITATORS
YOU KNOW WHY—

: Clark Meter Box has *made good* in 25 years actual service. Thousands of water depart- nts use it. No other "*Just As Good*" Can't Be. Prices are the lowest. Quick delivery. her Clark Goods are in same class.

rade Mark

H. W. CLARK CO.
130 So. 17th St., Mattoon, Ill.
Everything for the Water Works
New York Salt Lake City
San Francisco Chicago

RAILS Locomotives, Cars, Machinery, Piling, Tanks

We've got too much
to list here, so we've issued
Bulletin 230
68 pages. *Get it now!*

ZELNICKER IN ST. LOUIS

HOW THEY DO IT IN OTHER PLACES

Valuable Illustrated Material, Statistics. etc., Regarding Methods, Materials and Appliances for Public Improvement Work, Sent Free of Charge

Manufacturers, engineers and others doing business with municipalities are invited to submit catalogs or circulars suitable for mention in these columns. THE AMERICAN CITY *should always be mentioned when writing for this material. Officials who check over these items each month and write for such printed matter as interests them will find this a convenient way of keeping their information files up to date.*

Hand Cleaning of Catch Basins Now Out of Date.

Chicago, San Francisco and a number of other cities have found a way to clean their catch basins which is not only cheaper, but more effective than the old hand method. These cities are using the Auto Eductor, and a circular describing this method may be secured from The Otterson Auto Eductor Company, 817 Fairbanks Building, Springfield, Ohio.

A Recording Pitometer.

The prime function of a clock is to measure time accurately. The prime function of a pitometer is to measure velocity of water flow accurately. Combining the two, the Pitometer Company, 55 Duane Street, New York City, offers, in Bulletin No. 4, a recording pitometer which is worth investigation by water-works officials who are concerned in cutting down water waste thru leaks and carelessness. A history and description of the pitometer, assisted by illustrations and plans, make the pamphlet a valuable reference guide.

An Expansion Joint That Doesn't "Ooze."

The advantages claimed for "Elastite," an expansion joint manufactured by the Philip Carey Company, 8 Wayne Avenue, Lockland, Cincinnati, Ohio, are discussed in a folder issued by the company. This product is briefly characterized as "a factory-made expansion joint consisting of a uniform body of pure asphalt compound, compressed under roller pressure between two layers of high grade wool felt saturated with asphalt and bonded together inseparably by the Carey process. The method of installation is described, with illustrations, and a strong selling argument in the form of a summary of fourteen telling advantages is included.

Paint That Preserves.

"Protective paint costs less than rust catastrophe" is a saying of the Joseph Dixon Crucible Company, Jersey City, N. J. In its house organ, "Graphite," for November, 1917, this concern illustrates the viaduct of the Fort Smith Light & Traction Company, at Van Buren, Ark., painted in 1914 with Dixon's silica-graphite paint. The paint is still in good condition, despite the fact that the structure is carried over railroad tracks and is subject to continuous and heavy attack of smoke, heat, dust conditions and abrasion.

Arc Lamps and Lighting Systems.

An interesting and valuable catalog (No. 7-A) has been issued by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. It presents in detail Westinghouse arc lamp and street lighting systems, with full data and prices. The rear half of the catalog is concerned with ornamental lighting standards, street hoods, brackets, newels, reflectors and other lighting fixtures and accessories manufactured by the Geo. Cutter Company, 418 Notre Dame Street, South Bend, Ind.

For Sanding Icy Sidewalks and Streets.

One good way to avoid accidents and litiga due to slippery sidewarlks and pavements is by use of a sand spreader. A light, practical spr ing cart for this and other purposes is featu in a circular distributed by the Buffalo Munic Equipment Company, Mutual Life Building, B falo, N. Y. This cart distributes dry sand eve on slippery surfaces, and the amount of work complished is limited only by the distance operator is able to walk. The sander is also nished for hand use in the form of a special tainer which will hold 23 pounds of sand, and be used where the larger sanders are not practi

Meter Boxes for Cold Climates.

A circular folder distributed by the H. W. Cl Company, 130 South Seventeenth Street, Matto Ill., tells the story of a weatherproof me housing of vitrified earthenware or concrete, w a hat-shape iron cover and bolt-locking lid. details of construction and points of advantage brought out by means of a sectional draw Attention is also called to the Clark meter test service boxes and testing instruments.

An Ornamental Calendar of Timely Appe

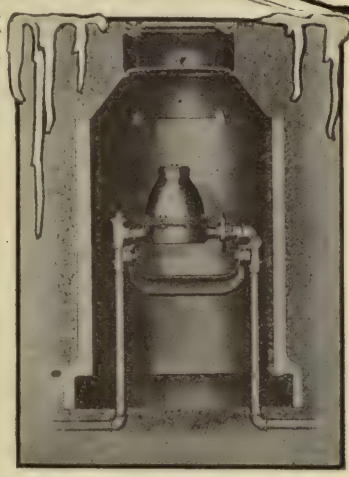
What's the unfailing topic of to-day? The w of course! Mindful of this, the Lebanon chine Company, Lebanon, N. H., manufactur of cast iron signs for every purpose, and of spe machinery and auger bits, has issued a large artistic calendar, the outstanding feature of wh is a colored "aeroplane view" of the Europ battlefields, from southern France to the K Canal. On this map the progress of the war the shifting battle lines from year to year marked out, and all the cities and towns that h figured in the struggle are shown. The calen is "yours for the asking."

Steel Products for Roads, Sewers a Curbs.

In addtion to a complete line of building prod for the erection of steel buildings, "Kahn Bu ing Products," a 104-page booklet now being tributed by the Trussed Concrete Steel Compa Department C-43, Youngstown, Ohio, in seventh edition, calls attention to steel reinforc products of special interest to contractors and p lic works officials. Among these are rib m for reinforcing concrete sewers, Kahn road m for concrete roads, Kahn armor plates for protection of expansion joints in concrete ro and Kahn curb bars and edge protectors for crete curbs.

Continued on page 36

JACK FROST CANT DAMAGE THIS METER



WINTER is here once more. Run back in your mind over the years gone by and think of the number of water meters that were damaged by frost or blows and think of what it cost to repair them! All this extra expense could have been saved if you had only given your meters proper protection. Are you going to let this happen again this year? You can give your meters *absolute protection* by placing them in Ford Meter Boxes. The Meters will then be free from the destroying hands of Jack Frost and human meddlers.

Here are eight good reasons why you should use the Ford Meter Box.

1. Meter is safe from frost damage.
2. Meter is safe from tampering.
3. Consumer is always at home to reader and in consequence inspector will read many more meters per day than with basement settings.
4. The reader is relieved of any temptation to record fictitious readings because of consumers absence from home.
5. The liability of admitting a burglar under guise of a meter reader is avoided.
6. All water entering property is registered and leaks on inside piping will be promptly repaired.
7. Meter is less liable to damage from hot water backing up from range boiler when located at curb.
8. Ordinary curb box and curb stop may be done away with if desired.

Write us for illustrated material at once and learn how you may save real money for your city

The Ford Meter Box Co., Wabash, Indiana

Valuable illustrated material, catalogs, statistics, etc., as mentioned below, relative to methods, materials and appliances for public improvement work, will be sent free of charge if you mention THE AMERICAN CITY. See page 34.

Lighting Posts of Concrete.

A set of circulars on the subject of concrete lighting posts has recently been issued by the Chicago Concrete Post Company, 608 South Dearborn Street, Chicago. The first circular of the set describes the posts and enumerates their advantages. The rest of the circulars are photographs of a number of attractive designs adapted for use on boulevards, streets and parks, and constructed to withstand extremes of weather without cracking, freezing or discoloring.

A Complete Catalog of Fire Equipment.

Edition No. 5 of "Fire Protection Equipment and Fire Department Supplies," issued by the American-La France Fire Engine Company, Inc., Elmira, N. Y., is a complete category of fire protection equipment. Within its pages everything from lantern hooks and metal polish to the last word in oxygen breathing apparatus, portable fire escapes, asbestos clothing and small-town fire-fighting apparatus has a place. The book should be of unusual interest, not alone to fire department officials, but to everybody who has a desire to protect himself and his possessions from the ravages of fire.

An Efficient Concrete Mixer for Public Work

"Concrete Mixers" is the title under which the Jaeger Machine Company, 215 West Rich Street, Columbus, Ohio, has issued an attractive pamphlet on the subject of the Jaeger concrete mixer. Numerous illustrations show in detail the construction and operation of this mixer, while many photographs show it in action, with its various accessories, in a great variety of capacities, such as street and sidewalk paving, plaster mixing, bridge and abutment work, sewer and trench work, water-works and reservoir construction work, grouting work, etc. Grouting outfits, spouting plants, various types of truck and skid mountings, and numerous other accessories are described. A page is also devoted to a discussion of Jaeger engines and force pumps.

Special Offerings in Pressure Tanks and Stand-Pipes

The Walter A. Zelnicker Supply Company, 325 Locust Street, St. Louis, Mo., has issued, in "Bulletin No. 224," a list of special offerings in pressure tanks of various capacities. This bulletin also calls attention to storage, car, and acid tanks, listing available stock in each type. A special 127-foot stand-pipe is announced. Further inquiry regarding the large stock of this company, of which the list in the bulletin is only a selection, is invited.

A Self-Loading Dump Wagon.

A circular folder issued by the Baker Manufacturing Company, 503 Stanford Avenue, Springfield, Ill., describes the Baker-Maney four-wheel scraper. This machine combines the functions of a scraper, a loader, a dump wagon and a dirt-spreader. Questions regarding the operation and economical performance of the machine are answered, and testimonials from users bear witness to their thoroughness and serviceability.

Serviceable Garden Hose.

Long wear and "non-kinkability" are two qualities without which hose ceases to attract those who have the care of lawns and gardens. Both virtues are emphatically claimed for Republic garden hose in a folder issued by the Republic Rubber Corporation, Youngstown, Ohio. This circular, gotten up in a very attractive manner, offers good quality hose at popular prices, constructed to meet varying demands.

Plant Evergreens Early.

The 1917 fall price list of The D. Hill Nurser Company, Inc., Box 406, Dundee, Ill., presen timely and interesting information regarding th permanent and beautiful trees which are the spe cialty of this company. The statement, "Hill Evergreens Grow," which heads the circular, a peals to the park superintendent and the tree love who are making selections for early winter plan ing. Hardy evergreens for window boxes an tubbing and potting, deciduous trees and orna mental flowering shrubs are also featured in th folder.

Tree Surgery.

Two very attractive booklets have been prepare setting forth the purpose, the history and the a vantages of the Davey Institute of Tree Surger which is operated by The Davey Tree Expe Company, Elm Street, Kent, Ohio, to fit men t practice tree surgery as developed by John Dave One of these booklets, under the title "Th Training of Tree Surgeons," contains an interes ing illustrated article based on personal observa tion of the Institute at work. The other, calle "Tree Surgery—The New Profession," gives mor specific information about the personnel of th company, and many testimonials as to the wor of Davey tree surgeons in different parts of th country, abundantly illustrated.

Road Building and Earth Handling Ma chinery.

In addition to road graders, drags, scarifiers an planers, dirt spreading wagons, dump wagons an other apparatus for road work, "Catalogue No 17," issued by the Russell Grader Manufacturin Company, Minneapolis, Minn., presents a substan tial line of bridge and culvert material, such a cast iron and galvanized metal culverts, culver grates, standardized steel beam bridges for plan and concrete floors, ornamental railings, reinforce ment bars, "I" beams, metal arches and stee piles. There is much in this catalog to interes contractors and public works officials.

Water Purification.

A pamphlet of considerable interest to wate works officials has been prepared, describing th water purification plant recently installed by th Pittsburgh Filter Manufacturing Co., Pittsburgl Pa., at Great Falls, Mont. This modern equip ment embodies the latest and best features o water purification practice, and for this reaso the pamphlet should be of particular value t those who are considering the installation of up to-date plants to keep pace with the demands o a growing population.

Fire Engines "in the Service."

The January "War Number" of *The American LaFrance,* issued monthly by the American-La France Fire Engine Company, Inc., Elmira, N. Y. shows fire apparatus now installed in a number o army training camps. An interesting item de scribes this equipment and its work in th camps. A cartoon entitled "Bill the Bully Is i for a Bad Fall," in which the Kaiser gets som jolts, supplies a lively note.

Trees, Shrubs and Flowers for Public Grounds.

It is not too early now to begin plans for th beautification of the city's open spaces this sprin and summer. Live park superintendents, as we as property owners who take pride in the attrac tive appearance of their home surroundings, wi therefore welcome the exhaustive catalog recentl issued by J. G. Harrison & Sons, Berlin, Mc This presents an infinite variety of fruit tree nut-bearing trees, shade trees, evergreens, shrub flowers and vines, as well as instructions an pointers in the art of spraying, fruit-packin pruning and like subjects.

CHAPMAN VALVES
and
ACCESSORIES

Everything for Water Works and Sewage Disposal but the Pipe.

Corporation and Curb Cocks.

Goosenecks—made up with Anderson couplings which eliminate wiped joints.

Gate Valves
Sluice Gates
Hydrants

Catalogue containing valuable information free on request.

Write Today

THE CHAPMAN VALVE MFG. CO.
Indian Orchard, Mass.

Proposal and For Sale Notices, Help Wanted and Situation Wanted Advertisements, Etc.

STATE ROAD WORK

HARRISBURG, PA.

Pennsylvania State Highway Department, Harrisburg, Pa. Sealed proposals will be received at said office until 10 A. M., February 19, 1918, when bids will be publicly opened and scheduled and contracts awarded as soon thereafter as possible, for the reconstruction of the following pavements: 1.73 miles of reinforced concrete in Tioga County; 5.42 miles of reinforced concrete in Huntingdon County; 3.01 miles of bituminous concrete on a concrete base in Blair County. Two pieces of reinforced concrete 2.33 and 4.98 miles in length in Lawrence County; two pieces of reinforced concrete 3.69 and 1.6 miles in length in Butler County, and 6.97 miles of reinforced concrete and 1.84 miles of reinforced concrete and vitrified block in Lycoming County. Bidding blanks and specifications may be obtained free, and plans upon payment of $2.50 per set, upon application to State Highway Department, Harrisburg. No refund for plans returned. They can also be seen at the office of the State Highway Department, Harrisburg, 1001 Chestnut Street, Philadelphia, and 904 Hartje Building, Pittsburgh.

J. D. O'NEIL,
State Highway Commissioner.

FURNISHING GATE VALVES, CUTTING-IN SLEEVES AND VALVES, AND VALVE BOXES DEPARTMENT OF PUBLIC SERVICE, IMPROVED WATER-WORKS

CITY OF AKRON, OHIO.

Sealed bids or proposals for furnishing gate valves, cutting-in sleeves and valves, and valve boxes will be received at the office of the Director of Public Service, Akron, Ohio, until 12 o'clock noon, Central Standard time, of Thursday, the 21st day of February, 1918, at which time and place they will be publicly opened and read.

The work is divided into three separate contracts, as follows:

Contract 92, for furnishing Gate Valves, includes 1 36-in. motor-driven gate valve, about 220 hand-operated gate valves from 6 in. to 16 in. in size, 7 8-in. to 10-in. check valves, and 1 10-in. foot valve; proposal bond or certified check in the sum of one thousand dollars ($1,000.00) will be required.

Contract 98, for furnishing Cutting-in Sleeves and Valves, includes about 48 sleeves and valves varying in size from 4 in. x 4 in. to 24 in. x 12 in.; certified check in the sum of three hundred dollars ($300.00) will be required.

Contract 99, for furnishing Valve Boxes, includes about 260 valve boxes; certified check in the sum of one hundred dollars ($100.00) will be required.

All proposals must be made on the forms provided by the city.

A surety bond in the sum of fifty (50) per cent of the amount of the contract will be required of the successful bidder.

Specifications on each contract may be seen at the office of the Director or copies may be obtained from the Engineering Department, Water-Works Office, 102 E. Mill Street, Akron, Ohio.

The right is reserved to reject any or all bids.

G. P. HOFFMAN,
Director of Public Service.
H. H. FROST,
Superintendent of Water-Works.
G. G. DIXON, Engineer.

Manufacturers' Representatives

The Municipal Supply Company, 402 Starks Building, Louisville, Kentucky — a company formed for the purpose of handling all lines sold to public officials—would be interested in representing manufacturers of lighting standards, and railway poles, fire hose and all fire department equipment and supplies, labor saving machinery and in fact anything that can be sold to counties, cities or township officials.

We invite correspondence and will be glad to give further information, references, etc., to anyone interested.

Address as above.

WATER-WORKS SUPERINTENDENT WANTED

A large eastern city is in need of an able and experienced water-works superintendent. Should be 30 to 35 years old, with college training and good technical acquirements. This is a *good* chance for a *good* man. Write in detail as to education, experience, etc.

Address, Box 50, THE AMERICAN CITY.

BIDS FOR AERIAL TRU
Sealed proposals will be
ceived at the office of the
Clerk, New Castle, Pa., up
10 o'clock, Tuesday mor
February 26, 1918, for one A
truck, motor driven, ladde
be 75 to 80 feet in le
Bidders to furnish own speci
tions. Truck to be fully eq
ped. Each proposal to be
companied by a certified c
for $500. All bids to be in se
envelops marked "Aerial T
Bid." Rights reserved t
ject any or all bids.
C. ED BROWN, City Clerk.
New Castle, Pa., Feb. 17,

FOR SAL
1250-yd. **Cummer Asp**
Plant, complete.
5—6-ton **Kelly-Spring**
Road Roller.
3—1000 gal. **Asphalt Ket**
40 H. P. **Boiler** and 30 H
Engine.
Kinney Asphalt Pump, C
plete.
No. 14 **Koehring Conc**
Mixer, with Bucket
Boom.
THEODORE F. HUSS
50 Church St., New York, N

A BIG SECRETARY
SIRES BIGGER JO
Now General Secretary of C
ber of Commerce in City of 85
Able and efficient executive, c
tensive experience. Here
chance for a Big Town to
Big Man. Correspondence
vited. Address, Box 25, ca
AMERICAN CITY.

MUNICIPAL ENGINEER WA
City of 10,000 population desires a
tion from competent engineers capa
taking charge of all public work and mu
water plant. Splendid opportunity for
man who desires to equip himself
duties of a City Manager. Only writt
plications with full particulars and
ences will be considered. State sala
quired. Address MUNICIPAL, 616
Building, Newark, N. J.

"KEEP THE HOME FIRES BURNING"

Save and spend wisely, thrift or luxury in excess may become a National weakness, for never in the Nation's History was it so vital to have Good Roads for transportation.

It is Necessary to Keep up Public Improvement. It would be false economy not to.

Have your streets paved with a substantial construction that will stand the motor vehicle traffic.

PAVE WITH BITULITHIC

BITHULITHIC PAVEMENT
Oneida Street, Utica, N. Y.
Oneida Street is a part of State Highway Route No. 23 between the Cherry Valley Turnpike and the "Adirondacks"

"Over the Top" of old macadam and old pavement surfaces (which are too far worn to be of further value as a pavement surface but still of value as foundation for a new surface) **thus saving the expense of new concrete base.**

BITULITHIC

is the city's best asset—Pave the right way—It is the only method that pays.

Keep your streets well paved.

Insist on BITULITHIC

Help "Win the War"— by affording good streets for motor transportation.

All to gain—Nothing to Lose.

STOP—THINK—ACT

Investigate **BITULITHIC**. It is the pavement worth while.

Write for illustrated booklets.

WARREN BROTHERS COMPANY

Executive Offices: BOSTON, MASS.

DISTRICT OFFICES:

New York, N. Y.
Nashville, Tenn.
Richmond, Va.
Utica, N. Y.
Chicago, Ill.
St. Louis, Mo.
Toronto, Ont.
Phoenix, Ariz.
Rochester, N. Y.
Los Angeles, Cal.
Portland, Ore.
Montreal, P. Q.
Winnipeg, Man.
Vancouver, B. C.

Put Public Buying on an Efficiency Basis

NOW, more than ever before, it is important that those having contracts to let, whether for new work or the furnishing of machinery or supplies, should consider the best methods of securing extensive competition and low bids.

Engineering News-Record

with a circulation of nearly 40,000 a week, reaches almost every worth-while contractor, manufacturer and dealer interested in public contracts.

Over 4,000 Official Proposals

have been published each year in Engineering News and Engineering Record, now consolidated as the Engineering News-Record. These small investments for advertising have invariably saved large sums on the contract prices. You can now cover the entire field and secure the greatest possible competition from reliable contractors by publishing your advertisements for bids in the

One Dominant Paper

This will put your public buying on an efficiency basis. It will make the tax payers' money go farther and will give you a reputation for a business administration. Local bidders always figure closer when they find that the letting of a contract is being advertised in Engineering News-Record — the

One Nationally Recognized Medium for Proposal Advertising

Ask for a free sample copy and see how other communities keep down their expenses

Engineering News-Record

10th Ave. at 36th St., New York

HAROLD S. BUTTENHEIM, Editor THEODORE R. KENDALL, Engineering Editor M. V. FULLER, Associate Editor

THE AMERICAN CITY

Published Monthly by The Civic Press, Tribune Building, New York

EDGAR J. BUTTENHEIM, President HERBERT K. SAXE, Secretary-Treasurer JAMES H. VAN BUREN, Advertising Manager

Branch Offices: Chicago, 327 South LaSalle St., J. T. Dix, Western Representative; San Francisco, 320 Market St., W. A. Douglass, Pacific Coast Representative

Entered at the Post Office at New York, N. Y., as second-class matter

Vol. XVIII CONTENTS FOR FEBRUARY, 1918 No. 2

ARTICLES APPEARING IN THE CITY EDITION ONLY

War-Time Housing—England's Most Urgent Civic Lesson for America 97

Types of England's War Housing 100

By-Products from Tin Cans 102

Street Paving and Maintenance Methods in Chicago 103

Cincinnati's Home Rule Charter 108

What Constitutes Evidence in Prosecution for Arson 109

The Treatment of Sewage by the Activated Sludge Process—Part II 114

What Place Will Your City Hold in the New Liberty Loan? 119

Letters to the Editor 120
- Charles Mulford Robinson
- Favors Town Manager Form of Government

ARTICLES APPEARING IN THE TOWN AND COUNTY EDITION ONLY

A Resolution Which Should Be Heartily Endorsed by All Highway Officials 97

Priority Order No. 2 Suspended—The Resumption of Road Work Allowed 97

Motor Trucks and Highway Transportation 98

J. Caesar, Road Builder 101

Roads in Winter 102

The Highway Industries Association 104

The Proposed Dallas County Road Maintenance System 105

The Farmers' Interests Are Largely Dependent on Good Roads 107

Defects in Bridges 108

Community Fire Protection 112

Wood Cutting to Overcome Fuel Shortage 113

Lessons in Fighting Malaria 114

The Educational Needs of the Negro 120

ARTICLES APPEARING IN BOTH EDITIONS

Forward Steps Reported by Municipal Officials and Heads of Departments 121
- New Attractive Lamp Standards
- Concrete Alleys a Success in Johnstown
- A Doubly Effective Course of Public Health Lectures
- Ice Rinks for Everyone
- A Community House Always Open
- The Park that Perseverance Built
- Toledo Starts Comprehensive Sewerage Work
- "New Lamps for Old" Releases Copper Wire for New Services
- An X-Ray of Baltimore's Streets
- Municipal Lighting Plant Shows Gains in Face of High Costs
- St. Paul's Municipal Bank
- Road Maintenance a Prime Asset

The Unemployment Problem After the War 135

Civic Work of Educational Institutions .. 136
- The National Crisis Demands a New Kind of Public School Teaching

Montevideo: The City of Roses 139

A City Managers' Year-Book 143

War Gardens as City Assets 144

Conserve Ammonia by Using Natural Ice. 148

An Efficient System of Garbage Collection and Disposal 149

On the Calendar of Conventions 151

Items of Municipal Law 152
- Regulating Golf Courses
- Control Over Municipal Corporations
- Incinerator Plants as Nuisances
- Steeple Bells as Nuisances
- Validity of Occupation License Tax

A Back Yard Contrast 153

Municipal Departments Rely Upon Motor Apparatus for Efficient Service 154

News and Ideas for Commercial and Civic Organizations 157
- The Americanization Movement in Rochester
- A Comprehensive War Council
- New Citizens Welcomed
- A Comprehensive Highway Development Program
- A Successful Curb Market
- A Community Planting Bee
- A Means of Preserving Man-Power
- Proportional Representation in Chamber of Commerce Election
- The Honor Roll of Washington, Pa.
- Committees Mobilized for War Service
- New Bulletins
- Recently Issued Printed Matter

The Water Purification and Softening Plant at Great Falls, Mont 173

Municipal and Civic Publications 181

Methods, Materials and Appliances 185

Two editions of THE AMERICAN CITY are published each month, both containing the same number of pages. The distinction in contents is indicated above. The subscription price of either edition is $3.00. For $1.00 additional per annum, any subscriber may receive both editions; or any subscriber may have his name transferred from the mailing list of the City Edition to that of the Town and County Edition, or vice versa, without extra charge. Canadian subscribers pay 50c extra per year to cover postage; other foreign countries $1 per year extra.

Back numbers of THE AMERICAN CITY are kept in stock by the publishers.

Holophane Helps Nature Illuminate Your Streets

The natural illumination of the moon and the stars was not sufficient to light up our streets in the best and most practical fashion. And so, from the early centuries there have been discoveries of various types of artificial light to supplement the light of the heavens, from the torches and lamps down to the beautiful ornamental electric lighting standards. But this was by no means the highest attainment in lighting. We have gone a step farther—and a long one too—and have produced what is known as the Holophane Refractor. Authorities say that this is the greatest advance in street lighting accessories yet made.

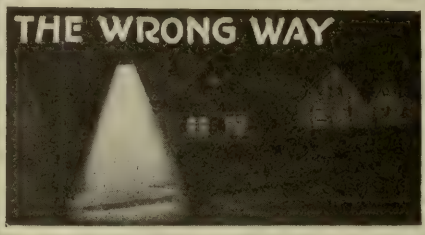
HOLOPHANE
SYSTEM OF ILLUMINATION

Makes a good street lighting system better.

Holophane cuts the cost of operation. Less current and fewer units are needed. It effects a saving which should not be considered lightly in view of the present coal situation.

Progressive officials should write for our free literature on how to cut the cost of lighting and secure better illumination.

THE HOLOPHANE GLASS CO., Inc.
Dept. B-22. 340 Madison Ave., New York City



VOLUME XVIII
NUMBER 2

The American City

NEW YORK
FEBRUARY,
1918

PHILLIPS UNIVERSITY LIBRARY

War-Time Housing—England's Most Urgent Civic Lesson for America

By Frederick L. Ackerman

EDITORIAL NOTE.—*The author of this article is a New York architect who has long been a student of industrial housing problems. Realizing that America has much to learn from England's recent experience, the American Institute of Architects arranged with Mr. Ackerman to visit England for a special study of the relation of housing, town planning and adequate environment to efficiency and the maximum production of munitions. Mr. Ackerman's recommendations for Governmental action, which are here presented in brief, are based on his detailed report of English practice, now obtainable in pamphlet form from him or from the "Journal of the American Institute of Architects," Washington.*

THE war, like a sharp knife in the hands of a surgeon, has cut clean thru the superficial layers of social and industrial England and revealed the causes underlying "labor unrest." No longer is England dealing with symptoms; the knife has done its work. No longer is it of value merely to theorize; no longer is it of value to propose feeble and uncertain remedial measures. The essential facts have been established: a major operation is required—useless organs must be removed and strong and healthy tissues substituted for those which are dead.

And the British people are not waiting for the days of peace and quiet to perform this operation. At least, such was the attitude revealed to me during my study of the conditions surrounding the fabrication of an almost inexhaustible store of munitions of war.

When the war broke, England was no more prepared than we; *but she judged its magnitude with a broader vision.* Instantly sweeping powers were created, a broad program established, and the road cleared of hampering obstacles. The scope and the technique of that broad program of war preparation are not my theme. I shall consider but a single phase—namely, the physical and social conditions which were created for the workers fabricating munitions of war.

What did I find? First of all a background of experience; a group of *constructive* legislative enactments looking toward the provision of better homes for workers; machinery already created for carrying forward this work; a Government fund which could be loaned to municipalities and limited-dividend corporations for forty to sixty years at a low rate of interest and under conditions looking toward the safeguarding of the fund.

I found that with all this pre-war mechanism the urgency of war, creating a demand for a great number of houses adjacent to munitions plants, required a more direct method; that as a central policy the pre-war methods of financing home building operations were speedily abandoned: that the Government took upon itself the entire financial responsibility; that it constructed and operated these communities. I also found that the Government worked with a bold hand; munitions and more munitions

were needed; everything had to give way to that idea. Stabilized conditions of employment must obtain; the labor turnover must be reduced to a minimum; the physical and social condition of the workers must be raised.

But how? The answer which the British Government made to this question was one *expressed in action and not in words.* Adequate living conditions were provided. There was no hesitation. Land was seized. Communities with schools, churches, hospitals, clubs, markets and the amenities were provided. A high standard was maintained, and these communities stand to-day as an expression of good judgment, farsightedness and a *substantial future asset;* for it must be remembered that there will be in Great Britain a serious shortage of homes for those who labor after the war. Some of these communities created during the urgency of war will stand, in post-war days, as monuments to British thoroness.

In contrast to the methods adopted by the British Government, the present attitude in America toward the solution of a like problem is pathetic indeed. Thus far we have demonstrated that we lack vision, that we are apparently without the ability to organize, and that our program, at this date, is based upon a hopeless misconception of the *purpose* for which we are to erect homes and communities adjacent to our shipbuilding and munitions plants. Months have passed and no effective legislation has been enacted. We have not as yet dared to seize land for this purpose, tho we seize all sorts of things for other purposes, and we propose to make the industrial corporations fabricating ships and munitions financially responsible for these housing investments. We have not had the vision to propose, as Great Britain has done, to erect an adequate home for the worker and charge for the same a reasonable rental based upon prewar conditions, and then write off the excess cost as war loss. We propose to break the problem up into tiny fragments—*in other words, we have no plan.*

Why not go at the problem directly? What we instantly require is adequate living conditions for shipbuilders and munitions workers, in order that the labor turnover may be reduced to a minimum. We are at war! Action should be conceived in scale with war. Adequate homes, adequate communities must be provided. If the cost is above normal, that excess cost should not be saddled upon labor or upon a single community, and in turn upon the worker to there remain, a burden for all time; it should be written off at the close of war as belonging to the cost of war.

Our tentative programs reveal the fact that those responsible for the formulation of the Federal policy have assumed that the building of ships, the fabricating of munitions, the winning of the war, are secondary to the driving of a good bargain. We are not waging this war for profit nor without loss; why should we base our policy, as regards this phase of war, upon the principle that the Government should not suffer a financial loss? It's stupid, it's tragic!

A Program for America

As long as there is sufficient material and sufficient labor to build the necessary houses, what does it matter how much these houses cost? What difference does it make as to how much we, in the end, write off as war loss? In comparison with the issues at stake, it makes no difference. We must brush aside all of the non-essential factors in this problem. *We must act.* We need homes surrounded by conditions of amenity wherever munitions or ships are being built. We need them in order to reduce the labor turnover to the minimum. *We need them now!* I insist and repeat that there is but one program which will meet the demands of war. It is as follows:

First, create a central body with:

(a) Powers to acquire land under authority equal to that created by the British Defense of the Realm Act (The final disposition of property need not now be treated)

(b) Powers to survey needs for housing facilities and to determine in cooperation with a central priority board, the relative importance of industrial operations

(c) Powers to design and construct communities where the needs of such have been made evident by the survey

(d) Powers to operate and manage these communities during the war, and for a few years thereafter, along lines of policy similar to that expressed by what is known as the Co-partnership Tenants or Public Utility Societies in England

(e) Powers to maintain a high standard of physical well-being in munition

DEVELOPMENT PLAN OF THE BRIDGEPORT HOUSING COMPANY, BRIDGEPORT, CONN.

GROUP OF HOUSES ERECTED IN BRIDGEPORT TO HELP RELIEVE THE PRESENT SERIOUS LACK OF LIVING ACCOMMODATIONS FOR MUNITION WORKERS

Another view of workmen's homes in the same city appears on the front cover of this issue

plants (adopting the standards set by our most progressive industrial corporations) and to organize community activities within the communities thus created

The second step:

Create a commission to study the final disposition of these properties. Such a commission should consider such questions as—

(a) The organization of local non-profit corporations to manage and develop the communities created during the war

(b) The saving of the appreciation of land values for the benefit of the community as a whole

(c) The establishment of that part of the cost which should be written off as belonging to the cost of war

(d) The basis upon which such communities could be transferred to municipalities, or non-profit corporations

By such a method it would be possible to advance immediately upon new schemes, and in the event of a lack of progress upon schemes now under way, such schemes could be taken over by the Government and handled thru the central body.

Those engaged upon this work in Washington state that such a program will not do in America. Why? Because it is British—so they say. It is no more British than American, except in that it expresses an ability to organize and to learn from *experience*. It is high time that we abandoned our self-satisfied attitude, our bumptiousness, and gave heed to what the British people have learned thru three years of experience and trial.

If those in Washington directing this work refuse to heed the lesson because it was learned in a British school of experience, if they refuse to treat the problem from the broadest social angle, if they persistently refuse to abandon a policy of bickering, if they refuse to acknowledge in terms of action that the purpose of this measure is to hasten the production of ships and munitions, if they refuse to treat the effort as a single problem and as a phase of war—let us demand a thoro and a sweeping reorganization covering men and policy.

Types of England's War Housing*

By John Nolen

Landscape Architect, Cambridge, Mass.

THE cottage type of permanent building erected by the varying methods of housing munition workers in England is characteristic of the newer industrial areas in that country. It consists of a two-story brick cottage built in rows, and containing two or three bedrooms, a living room, a kitchen and a bath.

The first type of building constructed in England for the munition workers is that known as huts. Under this heading are included all the buildings of a temporary or semi-temporary character, whether they are built of concrete slabs or of wooden framing covered with plaster or weather-board outside and lined inside usually with beaver board. This has been found on the whole the most satisfactory material for lining the huts when they are constructed of wood.

Three types of these huts have been built. The first consists of a pair of semi-detached single-family houses having three bedrooms, living-room, scullery, bath, etc. The second is a small hostel containing ten beds, which might be used either for a caretaker and nine single lodgers, or for a family taking six or eight single lodgers with them. It is, moreover, fairly readily converted into quarters for two families, similar to the first type. This hut has been found very popular, and not only has it been used for operatives, but it has also been used for members of the staff, and often taken as a larger house by officials of a higher grade. Then there is the third type, which consists of a larger hostel in which single men or single women can be lodged in numbers up to about a hundred, either in open dormitories or in dormitories fitted with cubicles.

The second classification or type is that of hostels. These have been built in the form of cottage shells of a permanent character, which, after the war, can readily be converted into good single-family cottages

* From a paper delivered at the Conference of the National Housing Association, in Chicago, October 15, 1917.

GOVERNMENT HOUSING SCHEME, WELL HALL, WOOLWICH, ENGLAND

by slight alteration. They were adopted because the Government found that the cost of temporary buildings of wood and slabs, when account is taken of all the costs of drainage, roads, water-supply, etc., is so little under that of permanent buildings that it seemed bad economy to build temporary structures except where the greater speed in operation was a vital consideration. The hostel has usually consisted of groups of four cottages each, linked up with temporary corridors and arranged sometimes in a row and sometimes around the three sides of a quadrangle.

The third class or type consists of completed cottages and staff houses. These are of various sizes, to suit the needs of the different grades of labor and of the staff employed in the factories. The small cottages are usually in groups of four, and the density is about twelve houses to the acre. The larger ones are built in pairs, semi-detached, with a little more ground usually left around them.

In addition to these three main classes of buildings, the Government has erected shops and stores, institutes and schools, and the other necessary public buildings required for a complete community in connection with some of the larger schemes. In one case they have had to provide bakeries, a central kitchen and laundry, schools, churches, and, in fact, nearly all the accessories of a small town.

These schemes in England have been carried out at various places. One good example is that of Well Hall in the pleasant valley of Eltham, Kent, which lies by the arsenal of Woolwich. This community is well described and well illustrated in the September, 1917, number of the *Journal of the American Institute of Architects.* Another development worthy of special consideration is that of Eastriggs.

By-Products from Tin Cans

How an English Municipality Turns Tin Cans into Cash

TIN cans in household refuse have been the cause of trouble and inconvenience and expense to many municipalities, owing to their unsightliness on a dump, as well as to the difficulty of disposing of them at a refuse destructor. In Hornsey, London, N., a method has been developed for treating the cans brought to the destructor, by which the solder and tin are removed and the steel is prepared ready for baling.

The salvage of the tin itself is commercially impossible at present in a small community, but a proportion of the tin and practically all the solder are recovered jointly by melting, the solder collecting in a trough from which the dross is removed. In recovering the solder, some difficulty was experienced at first in separating the metal from the dross, but this was overcome by a simple process, and the solder now finds a ready market, which is estimated to bring a minimum return of $250 a year.

The salvage of the scrap is not novel, but the method of burning off the tin and removing the solder is unique. The cans are sorted as soon as the refuse arrives at the destructor, and then they are cast into a specially designed cell heated by the gases of the flue as they leave the furnaces, detinning the steel and melting the solder, and permitting the latter to collect as described above. The cost of this method has been practically nil for operation, for it has been carried on as a part of the regular depot routine work. The only additional capital needed was about $1,000, the hydraulic machinery for baling being already installed.

The weight of tin cans received at the destructor averages about 1.35 tons per thousand population per year, and in addition there is about 0.65 tons of light scrap iron, galvanized and enameled ware. The scrap metal from the flue gas cell is pressed in the hydraulic machine into bales measuring about 27 by 15 by 4 inches. These bales do not require wiring, as they hold together perfectly, so they are loaded directly onto trucks for removal to the steel works. Light steel and other scrap is sorted out as the refuse arrives at the tipping platform, and is baled and sent to the steel or degalvanizing works without treatment by flue gas. Enameled ware has to be treated specially to remove the enamel before it is sold to the steel mills. This is done by firms specializing in the work. The steel and galvanized scrap have a ready market, and bring in about $1,000 a year revenue, in addition to doing away with the need of dumping the waste material and producing unsightly areas.

Courtesy of The Destructor Co.

THE DUMPING FLOOR OF A MODERN DESTRUCTOR, ATLANTA, GA.

ILLINOIS UNIVERSITY LIBRARY

Street Paving and Maintenance Methods in Chicago

By Felix S. Mitchell
Superintendent, Bureau of Streets, Chicago

IT is interesting to note that in the majority of large cities where subdivisions are laid out to provide for alleys in the rear, as is the case in Chicago, the average property holder is content with the improvement of the street, and the unpaved condition of the alley causes him no concern. If the streets are kept clean and repaired, garbage and ashes removed regularly, and refuse not allowed to accumulate in the alley, he is satisfied. The fact that an unpaved alley is a source of expense to him individually rarely, if ever, enters his mind. If he is the owner of an automobile, it apparently does not occur to him that he is compelled to wash and clean it much more frequently because of the mud or wet ashes in this unpaved alley; nor does he appreciate that it requires a greater number of teams for the collection of wastes because of the time consumed in making collections where there is no pavement, and incidentally increases the amount of his taxes; that it also increases the cost of street cleaning because vehicles carry the dirt on to the adjacent paved street, which again means more taxation.

Street and Alley Improvements

Fig. 1 shows how disproportionate are the percentages of pavement on streets and alleys; 64 per cent of streets are improved and only 13 per cent of the alleys.

The city of Chicago has often considered the advisability of abandoning teams in favor of motor apparatus for refuse collection, but so long as the alleys remain unimproved the idea must remain dormant, as existing conditions would only be aggravated by the cutting and rutting of heavy motor vehicles and there would be no saving of time or money. It is not uncommon for teams to become mired at present, and the delay naturally advances the cost of refuse removal.

Fig. 2 shows that during 1916 the favorite alley pavement was brick and a total of approximately 16 miles were paved. Concrete was second choice, with 14.77 miles.

It has been the idea of other cities that asphaltic concrete, as Chicago calls it, is a penetrated pavement, but for the sake of classification we call all concrete which is covered with a light application of asphaltic cement an asphaltic concrete or bituminous concrete. The pavement otherwise is the same as concrete and really should be considered as such, as the light application of bituminous mixture does not last for more than two years and is seldom replaced.

The prices in 1916 for the different classes of pavement were naturally lower than in 1917, but the last bids received, in October, 1917, were as follows, excavation not considered:

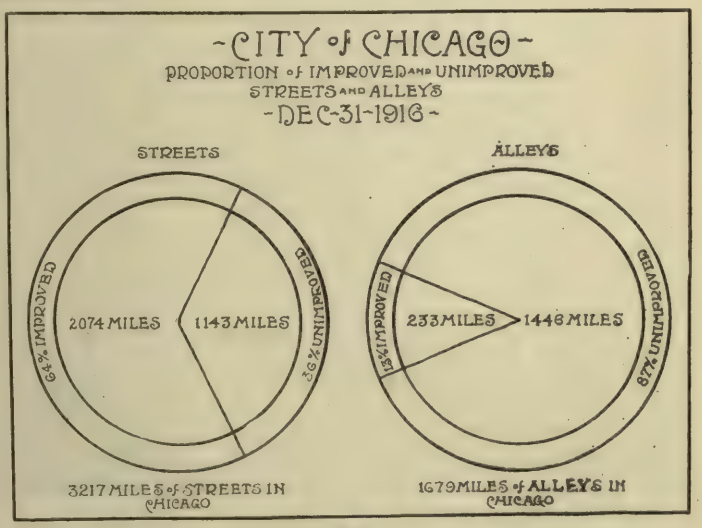


FIG. 1

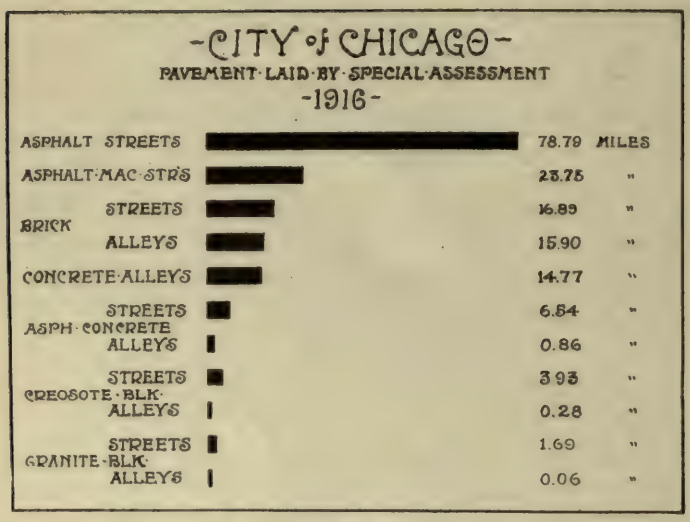


FIG. 2

	Per Sq. Yd.
Sheet asphalt, 6-inch concrete base, 1½-inch binder, 2-inch top	$2.32
Sheet asphalt, 6-inch concrete base, 1-inch binder, 1½-inch top	2.07
Brick alleys, 6 inches of concrete	3.16
Bituminous concrete alleys, 6-inch	2.12
Concrete alleys, 6-inch	2.00
Brick streets, 6-inch concrete base	3.08
Penetrated macadam, 2 gallons of bituminous mixture per square yard, 8-inch base large stone, 2½-inch top medium stone	1.49
Creosote wood block, 4-inch block, 6-inch concrete base, 1-inch mortar cushion	4.34

The widening of Twelfth Street provided for a No. 1, 4-inch granite block on 8-inch concrete base. This went for $4.99 per square yard.

Paving Mileage

Fig. 3 shows how the different pavements in Chicago are divided with reference to mileage.

Sheet asphalt seems to be the preferred pavement in Chicago, doubtless on account of its medium cost, its appearance, ease of cleaning, noiselessness, adaptability and ease of repair.

Macadam, as shown, was originally waterbound limestone, but the continual oiling operations have in most cases produced the appearance of a penetrated macadam. Nevertheless, extensive repairs are necessary, and this mileage is being reduced as fast as possible by more permanent pavements.

The great difficulty encountered here in Chicago when a repaving is proposed is that the property owners feel, once a street has been paved, no matter what that pavement may have been, it should be maintained indefinitely or forever by the city. The Vehicle Tax is the only fund available in Chicago for the repair and maintenance of pavements, and it is not increasing in proportion to the increasing mileage of streets coming out of reserve and which it is obligatory upon the Bureau of Streets to maintain.

Other cities have remarked that contract prices in Chicago are considerably lower than elsewhere. This may be due to the fact that the guarantee period has been reduced from ten years to five years as a maximum. The period of reserve is standardized as follows:

	Years
Asphalt street, with no surface lines	5
Brick street, with no surface lines	5
Brick street, with surface lines	2
Creosote street, with no surface lines	5
Creosote street, with surface lines	2

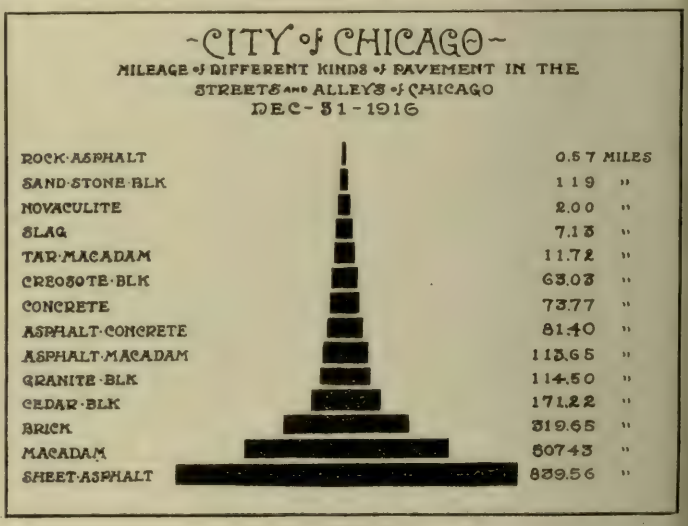


FIG. 3

	Years
Granite street, with no surface lines	5
Granite street, with surface lines	2
Concrete alleys	3
All other alleys	5

No water-bound macadam has been laid in Chicago for a number of years. The nearest approach to it is the bituminous macadam laid by the penetration method.

The five-year guarantee deposit of the contractor amounts to five per cent of the improvement and is held in case of default or neglect to repair upon notice by the Commissioner of Public Works. Provided the contractor complies with all the requirements of the specifications, the deposit is returned at the rate of one-fifth of the deposit at the end of each year.

In Fig. 3, it will be noted that Chicago still has a large mileage of cedar block, and yet no repairs have been made with cedar for years. These pavements have gradually been covered with crushed stone, and where nothing has been done the blocks have rotted and disintegrated and the street is considered as unimproved. When a street has once been paved, the records, of course, show a pavement, and the records were not corrected at the time the crushed stone was placed on the street. This was considered a repair, when in reality it was changing cedar to a macadam pavement of shallow depth.

There has been considerable discussion as to the exact definition of rock asphalt. We understand that some engineers classify it as a rock-bearing asphalt or bituminous substance. Chicago has a very small piece of this pavement. The rock being of a porous nature, it was penetrated when in place with a bituminous material. It is not superior, however, to a penetrated limestone macadam.

Sandstone block has been experimented with from time to time, and at present we have confined its use to steep grades, such as bridge approaches. Used in this way, we find it most satisfactory, as it gives a good foothold for horse-drawn vehicles.

The Novaculite laid in Chicago proved to be not as good as water-bound macadam, and has recently been torn up and replaced with creosote block. Slag and macadam are practically the same when wear and appearance are considered. Our macadam specifications in Chicago permit the use of slag for macadam foundations, but in nearly every instance the top is laid with limestone, and, as was previously stated, it is penetrated with a bituminous mixture. Tar macadam is similar to the pavements laid with Tarvia for a binder and makes a good improvement for a residential section not subjected to heavy traffic.

PHILLIPS UNIVERSITY LIBRARY

Asphalt concrete as laid by the Bureau of Streets is a plant mix and should be called bituminous binder. The formula corresponds very nearly to the Topeka specifications. The top is generally laid on old macadam at a thickness of two inches. In a few instances old brick and granite block streets were resurfaced with this mixture, and so far the results are very encouraging. Resurfacing of this kind should be done in hot weather, as the surface of cold blocks does not make a satisfactory bond and in a short time shows signs of creeping and rolling. Blocks are painted with a coat of hot asphaltic cement before any top is laid and rolled.

The Bureau of Streets has a total of 1,600 miles of pavement to maintain, and each year this is being added to at the rate of approximately 140 miles.

In 1916 the total collections from the Vehicle Tax were $992,717.86 and in 1917 they reached $1,120,000. No increase can be expected for 1918 at the present outlook.

All original pavements are laid by contract and are directly under the Board of Local Improvements until released from the reserve period and turned over to the Bureau of Streets.

Rules of Procedure in Street and Alley Work Before the Board of Local Improvements

Few property owners understand the course to be followed by the Board of Local Improvements and the Courts on proposed new street and alley work. Briefly given, the requirements of the law are as follows:

The Public Hearing.—When the Board of Local Improvements shall have concluded to undertake a local improvement by special assessment, such as street paving, sewers, water mains, or condemnation proceedings, it must first call a public hearing, notice of which is sent to the parties last paying taxes on all the property fronting on the proposed improvement.

The notice of the public hearing sets forth the extent of the proposed improvement and the engineer's estimate of the cost thereof.

At the time of the public hearing the Board may proceed with the improvement as outlined

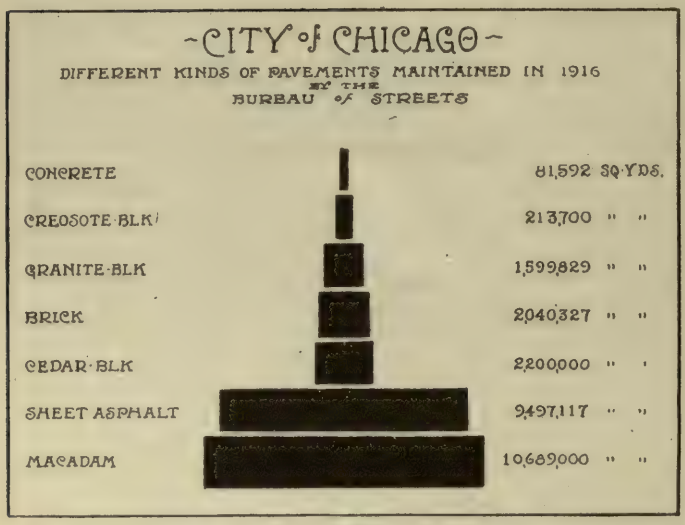


FIG. 4

in the notice, or it may modify the same to comply with the wishes of the property owners, or it may decide to abandon the improvement.

Council Must Pass Ordinance.—If the Board decides to proceed with the improvement, either as originally outlined or as modified, then a recommendation and ordinance is sent to the City Council. This ordinance may be approved or disapproved by the Council.

Petition to be Filed in Court.—If approved, then the petition is filed in court for the purpose of securing authority to spread the assessment. The petition being granted, the Department proceeds to spread the assessment, apportioning to each piece of property its proportionate share of the estimated cost of the improvement, based upon the benefit that each piece of property will derive from the making of the improvement. When this spread of assessment has been completed, it is prepared in the form of a roll.

Notices are then sent to all parties who last paid taxes on all property which it is considered will be benefited by the proposed improvement.

Property Owners May Object.—The roll is filed in court, and a day set for the time and place for the filing of objections, if any, by the property owners to the proposed improvement.

Court Must Confirm Assessments.—If objections are filed, then the proceeding is brought to a hearing in court for the purpose of determining the merits of the objections and to confirm the assessment, which, when confirmed, becomes a charge against the property for the purpose of making the improvement.

Board Must Advertise for Bids.—When the assessment has been confirmed, then the Board of Local Improvements proceeds to advertise publicly for bids for doing the work, as outlined in the ordinance and specifications. Bids are opened and announced publicly, and when tabulated in the different divisions, the tabulation is returned to the Board.

Contract is Let to Lowest Bidder.—The contract is awarded to the lowest responsible bidder who is not in any way in default with the Board or the city of Chicago, or any previous contracts.

All the proceedings of the Board are at all times open to the public, and when the contract has been awarded, the property owner may obtain a memorandum showing the price bid for each item in the specifications, and the requirements of the specifications under which the contract is to be fulfilled.

Then each property owner has an opportunity to inspect the work as it progresses and to satisfy himself that the contractor is in all respects complying with the terms of his contract and specifications.

Up to this time the amount of the assessment against each piece of property is based on the proportionate share that the piece of property should contribute towards the cost of the whole improvement. The actual cost of the

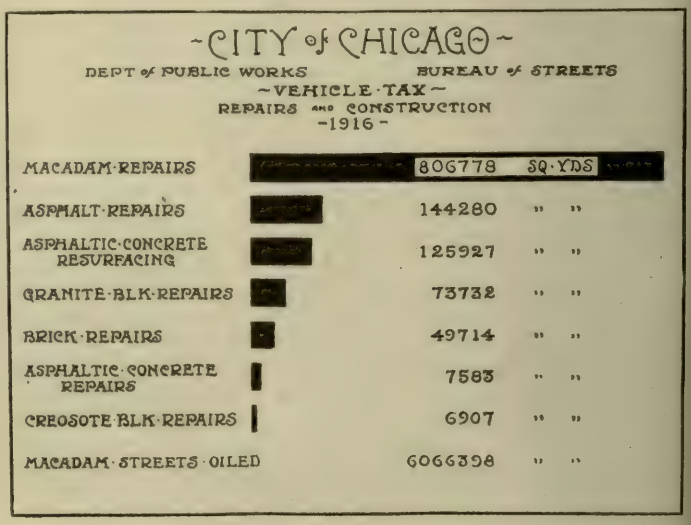


FIG. 5

work, however, may be more or less than the estimated cost as prepared by the engineer of the Board.

May Reduce Engineer's Estimate.—If the cost of the work is less than the estimate made by the engineer, the assessment against each piece of property is reduced, as provided by law, in exact proportion as the estimate as confirmed exceeds the cost as found when the work is completed.

The best interests of the property owner seem to be served by having the engineer make a sufficiently high estimate to cover the actual cost of the work, for the reason that if it is found that the estimate is somewhat in excess of the actual cost, it is an easy matter to comply with the law by reducing the amount of the assessment. It has been found that this careful procedure is in the direction of economy.

In the choice of pavement to be laid, the property holders are visited by representatives of concerns manufacturing different paving materials, and each lays before the property holder the factors favoring his particular pavement or material. The petition containing the majority of names in favor of a certain pavement usually determines the kind of improvement adopted. Salesmanship cuts considerable figure in this method, of course.

Municipal Asphalt Plants

The city owns and operates three asphalt plants for the maintenance of, approximately, 530 miles of asphalt streets. During 1916 these plants turned out 9,351 tons of sheet asphalt top, 9,867 tons of bituminous binder, and 21,330 tons of asphaltic concrete. The asphalt top cost $6.02 per ton, the binder $4.35 per ton, and the asphaltic concrete $4.23 per ton. For 1916 the actual cost to the city, per square yard, for repairing the different kinds of pavements was as follows:

Asphalt	$1.08
Brick	1.16
Creosote block	1.58
Granite block	0.61
Macadam	0.23
Asphaltic concrete	0.87
Resurfacing old macadam with asphaltic concrete	1.08

Fig. 4 shows the different kinds of pavements maintained in 1916 by the Bureau of Streets in Chicago. Fig. 5 will give an idea of the enormous repairs necessary where a city has a large mileage of macadam streets, and the advisability of putting down a permanent pavement instead of a pavement whose only merit is that it is cheap. The repairs to macadam mount so rapidly that in a few years the original cost is duplicated for maintenance. This, of course, applies only to cities where districts have materially changed and the growth has increased traffic beyond expectations. Traffic will always follow the best-paved streets, and as soon as one shows signs of wear traffic will diverge to the pavement in the next best condition. Time will soon prove that the foundations will have to be greatly increased or loads greatly diminished if our modern pavements are to stand the test of modern traffic.

The costs of repair for 1917 have shown a noticeable increase over 1916, due to the high prices for labor and material. Common labor is in great demand, and the city cannot meet the increases thruout the coming year. Such was the case during the past season, and the contractors or private concerns offering higher wages can immediately disorganize a city's forces. Improved labor conditions are not looked for in 1918, and the retrenchment felt in 1916 will be increased for the coming year. The Corporate Fund has suffered a serious shortage and a greater saving in all activities must be made, or special legislation measures passed immediately for relief. Chicago looks forward to a season of economic planning such as it has not had to experience in its entire history as a municipality.

Cincinnati's Home Rule Charter

By Lester A. Jaffe

Assistant Executive Secretary, City Club, Cincinnati, Ohio

THE Ohio Municipal Code, together with a few amendments, is the substance of the new home rule charter for Cincinnati, adopted last November.

One of the significant amendments was the creation of a City Planning Commission with very extensive, and, in some respects, legislative powers, to the point even of taking away some of the powers of Council. The original intention was to give the Planning Commission special and independent power to do the administrative work of the Commission, as in the cases of the Park and Health Boards. For some reason, opposition was manifested to that, and the final draft of this provision does not give the Commission the power that many advocates of city planning in Cincinnati had desired. Again, altho the Planning Commission consists of seven members, five are ex-officio, consisting of the Mayor, the Director of Public Service, and the three Park Commissioners; therefore only two actual city planning members are on the Commission. Another amendment changed the term of the Mayor, the President of Council, the Auditor and the Councilmen to four years from two.

One of the few additional offices created was that of Street Railway Commissioner. Under the terms of the new street railway lease, the city has complete control of the services to be rendered it by the company, and the stockholders of the traction company will receive their dividends on their stock and interest on bonded indebtedness before anything is paid to the city on its investment. It is therefore important to the city that the street railway be operated economically, and in order to see that this is done, and that the street railway service, together with rapid transit, shall be under a unified control, the provision for a Street Railway Commissioner was drawn.

The Treasurer and the City Solicitor are to be appointed by the Mayor, and not elected as heretofore. To this extent the short ballot is introduced in the charter.

Another beneficial amendment was a change in the provision for advertisement of ordinances and resolutions for improvement of streets. Instead of publishing the ordinances in full as heretofore, a simple synopsis of the ordinance is to be given.

The chief opposition to the charter, extending even to members of the Commission itself, was caused by the clause dealing with the powers of Council. This clause is as follows:

"All legislative power of the city shall be vested in Council, subject to the general and all local or special laws enacted by the General Assembly of the State of Ohio, now in force, relating to the organization and government of cities and their officers, and defining and limiting their powers and duties in so far as they apply to the city of Cincinnati, which laws are hereby adopted and continued in force as the charter of our city except as herein amended or supplemented."

There were two groups on the Commission itself. The one believed that power to legislate for the city, in so far as such legislation is necessary, should be reposed in the city Council; the other party believed it should be reposed solely in the electorate of the city and that such legislation should be absolutely binding on Council until the electorate chooses to amend it. A compromise was effected thru the agency of Attorney Lawrence Maxwell, and the clause as quoted above was adopted. Most of the citizens believe that the clause will have to be interpreted by the courts. At least it has a negative side. It eliminates state legislation, excepting from two or three fields of action which the Constitution retains and which cities may not take away.

Undoubtedly those who have had enthusiasm for such things as non-partisan government, council elected at large, modern regulation of public utilities, modern budget system, or simplified forms of city government, have been keenly disappointed with the charter. As a matter of fact, it does not deal with them at all; it leaves the form of municipal organization exactly as it is.

Besides the possibly constructive city planning provision, the charter contains one other good thing, and that is the right to amend it at special elections when the need arises. This brought support from most of the progressive element.

What Constitutes Evidence in Prosecution for Arson

By F. R. Morgaridge
Of the National Board of Fire Underwriters

IN this paper I have endeavored to explain some of the important points that arise in the course of a trial for arson and to indicate the present attitude of the courts concerning them. No attempt is made to do more than touch upon a few of these points and to refer to some of the leading cases and authorities.

At common law, arson was the wilful and malicious burning of the dwelling house of another. The crime of arson as it was known to the common law of England has been considerably extended by statute in many of our states. This has been very clearly explained by the Supreme Court of Illinois in a very recent case:

"Arson, at common law, was the wilful and malicious burning of the dwelling house, or outhouse within the curtilage of a dwelling house, of another person. It was an offense against the habitation, and regarded the possession rather than the property. The occupant was not guilty of arson, if he burned the building in which he lived." (People v. Covitz, 262 Ill., 518-9.)

If a landlord or reversioner sets fire to his own house, of which another is in possession under lease, etc., it is arson, for during the lease the house is the property of the tenant. (State v. Fish, 27 N. J. L. 323, 324.)

Contract to Purchase by One in Possession. An indictment for arson, charging

AN ARSON PLANT

Two barrels filled with oil-soaked waste paper and excelsior near a hot-water heater

the defendant with burning the property of another, is not sustained, if it appears by the evidence that the accused was in possession of the property under a contract to purchase. (State v. Fish, 27 N. J. L. 323.)

It is often important to determine whether the house that has been burned is actually a dwelling house; and the following may be of interest on this point:

Barn or Stable. A barn or stable, usually occupied by night by a person lodging therein, and so occupied when set fire to, is a dwelling house, in a trial for the crime of arson. (State v. Jones, 106, Mo. 302, 310.)

School. A school building, one part of which is occupied as a habitation with interior communication between the two parts, is a dwelling house within the meaning of the law of arson. (U. S. v. Cardish, 145 F. R. 242.)

Vacant and Unoccupied House. Where, on trial, the evidence showed that a house, tho it was built for a dwelling house, and had been used as such, and altho it was about to be used as such again, yet had been unoccupied for ten months previous, and was unoccupied when it was burned, it was held that the building was not a dwelling house within the meaning of the Virginia statute. (Hooker v. The Commonwealth, 13 Crat.—Va.—763.)

The Burning Need Not Be a Complete Destruction. An indictment for arson will be sustained, if it is shown that there is actual ignition, and the fiber of the wood or other combustible material is charred, and thus destroyed, even in small part, the burning is complete. (State v. Spiegel, 111 Iowa 701, 705, and cases cited.)

The burning must be the result of an intentional act by the defendant, not the result of an accident or mere negligence. (State Board of F. P. Res. Com'rs. v. Veeder, 87 N. J. L. 479, 480-1.)

The burning of one's own building is not a crime under the laws of Ohio, unless the building is insured. (Smith v. State, 1 Ohio C. C.—N, S.—496; 15 O. C. D. 24; 25 O. C. D. 24.)

Arson as Distinguished from Burning with Intent to Defraud. The crime of arson must be carefully distinguished from that of burning a building with intent to defraud an insurance company. The two are separate and distinct offenses, but it is possible to have both of them grow out of the same transaction. (People v. Bernstein, 250, Ill. 63.)

Under the former (arson) a person is guilty if he maliciously burn the property of another, whether or not it was also with the intent to prejudice, and he is not guilty thereunder for burning his own property, even if it be with the intent to defraud the insurer, while under the latter he is guilty if he burn his own property with the intent to prejudice the insurer, but not for the burning of the property of another. (Jones v. The State, 70 Ohio St. 36, 39, 70 N. E. 952, 1 Am. & E. Ann. Cas. 618.)

Counts charging arson may be found in the same indictment with counts charging the burning of goods to defraud an insurance company where the two offenses grow out of the same transaction. (People v. Bernstein, 250 Ill. 63.)

The Corpus Delicti—Of What Does it Consist?

The *corpus delicti,* or the substance of the crime, in arson is made up of two elements: first, that the building was burned; second, that it was burned by the wilful act of some person and not as the result of natural or accidental causes. The presumption is, say the authorities (altho its correctness may well be doubted in the light of our statistics) that when a building is burned, it is the result of accident. On this, the authorities are practically unanimous. Hence, before the State can ask for a conviction, it must overcome this presumption and then identify the guilty party. Rebutting this presumption of accidental origin of a fire and establishing a criminal agency is usually the most difficult and crucial point in an arson case. There probably has never been a case of arson tried where a confession was offered, or proof of motive, on the part of the accused, that counsel for the defense has not contended that the *corpus delicti* was not sufficiently proved to warrant th admission of the confession of proof of motive.

Probably as clear and condensed a discussion of what evidence is admissible in an arson case as may be found anywhere appears in Volume 5 of Corpus Juris, page 572 and succeeding pages:

"Any circumstances tending to rebut the presumption that the burning was accidental may be given in evidence as proof of the *corpus*

delicti, and when the fact of the burning is clearly and satisfactorily proved, and the circumstances are such as to exclude accident or natural causes as to the origin of the fire, a foundation is thus laid for the introduction of any legal and sufficient evidence, direct or circumstantial, that the act was committed by the accused, and that it was done with criminal intent.

"Accordingly, it is proper to receive evidence tending to fix the description, character and surroundings of the building at the time of the fire, and its possession, occupancy or control. For this purpose evidence of the contents of the building is admissible, except when the character of the building is not controverted. Not only the burning of the building in question, but also the extent of the conflagration and the burning of other buildings by the same fire, may be shown in evidence, and while evidence that other fires occurred in the vicinity at or about the same time as the burning of the building alleged in the indictment, or that the same or other property of the accused or prosecutor was on fire on previous or subsequent occasions, is not generally admissible in the absence of anything directly to show defendant's connection with the charge for which he is on trial, yet if it directly tends to connect defendant with the burning, alleged in the indictment, or to establish intent, or to show the incendiary origin of the fire in question, it may be received. So evidence of the burning of other property belonging to the same owner at almost the same time is admissible to show that the two fires were parts of a scheme concocted and carried out by the accused. The fact that defendant, a few months before the burning charged, requested another to burn the house is admissible in evidence.

"Evidence of incriminating circumstances tending to show accused's motives, malice or intent is admissible. Thus on the question of motive, evidence is admissible which tends to prove that accused set the fire for reward or gain, to secure employment as watchman, to destroy evidence of title, to destroy the record of a pending indictment against him or to conceal a murder of another. The acts and declarations of the accused showing the intention to burn the property in order to collect the insurance money are admissible against him.

"Threats made by accused against the person or property of the prosecutor, regardless of whether it is the identical property burned or adjacent property, may be shown, not only for the purpose of proving malice, but also to connect the accused with the commission of the offense; and the competency of testimony of threats is not affected by a considerable lapse of time intervening between their making and the burning of the building, or the fact that

A GROCERY WELL-ARRANGED FOR AN INCENDIARY FIRE

the ownership of the property changed in the interim, or that the threats were general, vague or indirect. However, evidence of a threat made after the fire is not admissible.

"Ill feeling or unfriendly relations between accused and owner may be shown.

"It is proper to admit evidence of incriminating circumstances tending to show that the fire was of incendiary origin and that the accused was connected therewith, such as evidence of defendant's act, conduct and whereabouts at or near the time of the fire, and his acts or preparation or his possession of the means or instruments by which the fire was set, or his possession of goods proved to have been in the building immediately before its burning, or that he removed insured goods from the building immediately before it was burned."

Confessions

The admissibility of confessions in the trial of arson cases is one of much interest to all of us. Some courts have gone so far as to hold a confession could not be admitted against the defendant until the State had otherwise made out its case beyond a reasonable doubt. Such a ruling would, of course, make confessions utterly valueless in prosecutions.

Fortunately, the great weight of modern authority is much more liberal, a recent Ohio case going so far as to hold that the state should not be required to make out even a *prima facie* case before the confession could be admitted.

An interesting question often arises as to whether a confession by the prisoner is a sufficient proof of the *corpus delicti,* uncorroborated by other evidence, so as to support a conviction. The general rule on this point is that something more than a prisoner's confession is absolutely necessary.

After a pretty thoro but by no means exhaustive examination of the reported cases on this subject, we are satisfied that the rule in this country is correctly stated in 6 Am. & Eng. Enc. Law (2d Ed.), p. 582:

"A conviction cannot be had on the extrajudicial confession of the defendant, unless corroborated by proof aliunde of the *corpus delicti.* Full, direct, and positive evidence, however, of the *corpus delicti,* is not indispensable. A confession will be sufficient if there is such extrinsic corroborative circumstances as will, when taken in connection with the confession, establish the prisoner's guilt in the minds of the jury beyond a reasonable doubt." (Flower v. U. S., 116 F. R. 241, 247.)

In a case worked up by the State Fire Marshal's office of Illinois, the Supreme Court of that state says:

"Proof that a school house in a country district was destroyed by fire about 2 o'clock in the morning, and that a man's footprints, made at a time when the grass and stubble were wet with dew, were found leading to and from the building, is sufficient proof of the *corpus delicti* to justify admitting the testimony of witnesses that the person charged with the crime confessed it to them." (People v. Hannibal, 259 Ill. 512.)

Voluntary Confession. By it is meant a confession not extorted by any sort of threats or violence, or obtained by any direct or implied promises. (Rossel v. State, 62 N. J. L. 216, cited with approved in State v. Murphy, 87 N. J. L. 515, 525; State v. Dolan, 86 N. J. L. 192, 194.)

The New York Court of Appeals gave the following valuable explanation of a "voluntary" confession:

"The competency of a confession is to be determined by the trial court upon the facts in evidence at the time it is offered. * * * After it is received, if a question of fact arises as to its voluntary character, the jury should be instructed to wholly disregard it, unless they find that it was voluntarily made, without threat or menace by acts, words or situation, and without compulsion real or apprehended, and without the promise, express or implied, that the defendant should not be prosecuted, or that he would be punished less severely." (People v. White, 176 N. Y. 331, 359.)

Is It Proper to Introduce Expert Evidence as to the Origin of a Fire?

In view of what has been said with respect to proof of the *corpus delicti,* it is a matter of great importance to the prosecutor to be able to prove that the fire was of incendiary origin. If he can lay a reasonable foundation for this, he may then offer evidence to connect the defendant with the crime. It is, therefore, an interesting problem to determine whether the opinion of one who has had special and peculiar means of knowledge with respect to fires, and who has inspected the premises in question which have been burned, either during or after the fire, might properly be received in evidence for the purpose of proving the criminal origin of the fire. In other words, may a fire marshal or the chief of a fire department be called to the witness stand to give his opinion as to the cause of a fire?

The cases on this question are not so entirely clear and harmonious as to leave no doubt on the subject. But the general rule concerning expert opinion evidence is as follows:

"As a rule, witnesses must state facts and not

draw conclusions or give opinions. It is the duty of the jury, or court, to draw conclusions from the evidence, and from opinions upon the facts proved. The cases in which opinions of witnesses are allowable constitute exceptions to the general rule, and the exceptions are not to be extended or enlarged, so as to include new cases, except as a necessity to prevent a failure of justice, and when better evidence cannot be had." (Teerpenning v. Corn Exchange Ins. Co., 43 N. Y., 279, 281.)

In some states, however, expert evidence to prove the incendiary origin of a fire is not well received.

Is it Proper to Prove That the Defendant Set Other Fires Than the One for Which He is on Trial?

It is frequently desirable to prove other fires or other crimes in order to establish motive, intent, absence of accident, a connected scheme, etc., and such evidence is frequently admissible. Following is what some of the authorities have to say in this connection:

"On the trial of an indictment for the malicious burning of a building on a certain day, it is competent for the government to show, on the question of the *intent* with which the defendant burned the building on that day, that the defendant set fire to the same building three days before." (Com. v. Bradford, 126 Mass. 42.)

In this case the court said in the opinion:

"The evidence was competent on the question of the intent with which the defendant subsequently burned the building, and committed the offense for which he was then tried. It was carefully limited (by the trial court) to the single purpose for which it was competent. The unsuccessful attempt to do the same thing, a few days before, was evidence that the burning was wilful and intentional, and not the result of accident or negligence on the part of the defendant. It was sufficiently near to the time of the commission of the offense charged to justify the inference that the defendant then had a settled purpose in regard to it. It is a rule of criminal law that evidence tending to prove a similar or distinct offense, for the purpose of raising an inference or presumption that the accused committed the particular offense with which he is charged, is not admissible. But there was no invasion of this rule in the admission of this evidence. The intent and disposition with which one does a particular act must be ascertained from his acts and declarations before and at the time; and when a previous act indicates an existing purpose, which from known rules of human conduct may fairly be presumed to continue and control the defendant in the doing of the act in question, it is admissible evidence. In many cases it is the only way in which criminal intent can be proved, and the evidence is not to be rejected because it proves another crime against the defendant."

Evidence Showing Motive on Part of Defendant

Among the many things that the State usually undertakes to prove in support of a charge of arson, one of the most common is that of motive.

Corpus Juris, Vol. 5, page 681, sums up the law on the question of motive as follows:

"While proof of motive is not necessary, but its presence or absence is a question for the consideration of the jury, or for the court of appeal in reviewing the evidence of guilt, yet the State commonly introduces evidence of motive, in which case, although it does not prove guilt, it is to be considered along with the other evidence, and it is not necessary for this purpose that the jury be first satisfied of the guilt of the accused."

After sufficient proof of the *corpus delicti* has been introduced, any suspicious circumstances or fact tending to show motive on the part of the accused can be introduced. Any statement of conversation about a fire, made previous to the time the fire occurred, can be introduced. A desire to leave the locality, an over-stock of goods, unsalable goods, insolvency and over-insurance, all present themselves in this connection. Any circumstance relating to the insurance policies just previous to the fire, such as additional insurance or precautions to safeguard the insurance policy, or any inquiry regarding the validity of the insurance carried, is admissible and can be introduced as tending to show motive on the part of the accused.

"Tracks" as Evidence in an Arson Trial

It often happens that at or close to the scene of a fire, tracks of some individual are discovered and followed. Frequently these tracks are so plain that they may be followed for some distance, and often prove helpful in ascertaining the culprit. It is well settled to introduce in evidence the fact that such tracks existed.

The correspondence between boots and footprints is a matter requiring no peculiar knowledge to judge of, and as to which any person who has seen both may testify. (Com. v. People, 103 Mass. 440.)

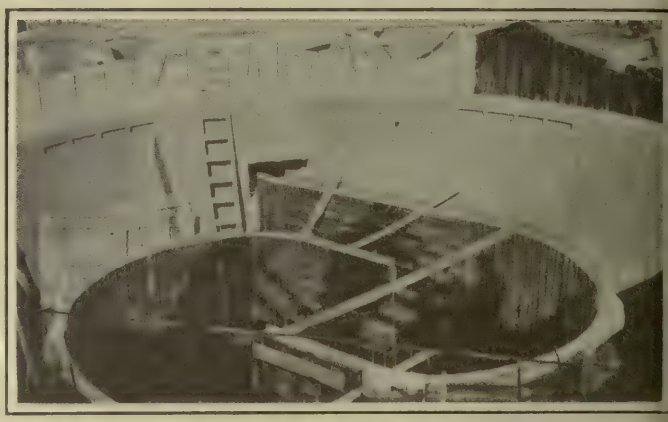
The foregoing article has been prepared from an address delivered before the last annual convention of the Fire Marshals' Association of North America.

The Treatment of Sewage by the Activated Sludge Process—Part II

Valuable Data from Milwaukee on this New and Effective Method of Sewage Treatment

Type of Sedimentation Tank

Sedimentation is the crux of the process, and great care should be taken in the design and operation of the sedimentation tanks. The characteristics of activated sludge are so different from those of sludges produced from other methods of treatment that the rules which apply to the latter will not apply to the former.



AERATING TANK WITH BAFFLES WHICH CAUSE SEWAGE TO TRAVEL 118 FEET HORIZONTALLY THRU TANK; MILWAUKEE, WIS.

Immediately after the aerated mixture of liquor and sludge comes to rest, the sludge forms in flocs of gradually increasing size and settles out of the liquor at the vertical rate of almost one inch per minute. If the mixture is well aerated, and not over-aerated, the liquor remaining is clear and limpid, otherwise it is turbid from colloidal matter which, in the first case, has not been absorbed by the aerobic action, and, in the second case, has been absorbed and thrown off by over-digestion.

The major portion of the sludge has a specific gravity of about 1.012, but much of it has the same specific gravity as the liquor, and, if separated from the larger floc, has a tendency to mix again with the top liquor thru the influence of cross-currents in the sedimentation tanks. If the flow thru the tank is too rapid or the accumulation of sludge too great, the sludge rises as a blanket to the surface and passes out with the effluent.

There has been much discussion of the efficiency of this blanket, and it is undeniable that the maintenance of such a blanket within a few inches of the surface acts as a strainer and produces a much clearer effluent. On the other hand, the maintenance of this blanket is a very delicate piece of work and requires constant, skillful manipulation of the valves connected with the influent and sludge removal.

There is a sludge blanket in every tank treating activated sludge. It is Mr. Hatton's experience that the safest point for maintaining the surface of this blanket is on a line level with the bottom of the influent baffle, which should be at least from 4 to 5 feet below the surface of the liquor. Thus the sludge enters the tank below the surface of the blanket, which acts somewhat as a strainer. At this depth below the surface a wide variation can be allowed without constant supervision.

The Extended Study of Sedimentation

Sedimentation has been given greater study at the Milwaukee Testing Station than any other feature of the process. Many different types of tanks have been operated for the purpose, primarily, of determining the best type of tank, flowing-thru velocity, area, depth and method of sludge removal. Without going into the minute details of these experiments, it will perhaps be sufficient to state the general conclusions warranted by them.

The running-thru velocity should not exceed 3 feet horizontally per minute, while

the detention period may be from thirty to fifty minutes, according to the character of the sewage treated. A combined vertical and horizontal flow is more efficient than either alone. The effluent must be removed with the least velocity possible, and over continuous rather than V-shaped weirs. The latter create cross-currents just where they are most objectionable. Cross-currents must be avoided so far as possible.

The flow should be across the narrow section of the tank, as too long a path of flow tends to pick up the lighter particles of sludge and carry them over with the effluent. A baffle should be placed just back of the effluent weir, extending a few inches below the liquor surfaces. This will prevent fats, match sticks and other light substances, which will float upon the surface, from passing out with the effluent.

The depth of the tank is immaterial, except that it must be sufficient to allow capacity for the settled sludge to be drawn off without abnormally increasing the under-currents near the level of the bottom of the influent baffle, due to the suction of sewage passing from the tank. An area of one square foot for each 1,600 gallons of well-aerated sewage should be provided in the settling tank; the less aeration, the greater the area required. The tanks may be either hopper- or flat-bottom, and the sludge may be removed by air lifts or hydrostatic pressure. If the hopper bottom is used, the slopes must be from 1 to 2 to 1 to 3, to keep the sludge moving towards the draw-off pipe. If the flat bottom is used, some apparatus must be provided to remove the settled sludge to a draw-off pipe. This may be done by means of a Dorr Thickener or similar device, or by squeegees similarly operated from the top of the tank. In the Milwaukee plant the last two devices have been used with satisfactory results. They insure a clean tank, and thicker sludge, and need less tank depth. By returning a thicker sludge to the aerating tanks, less air is needed.

Types of Air Diffusers

Several types of air diffusers have been tried out at the Milwaukee Station, among them field tile, thin wood blocks cut cross-grain, perforated pipes and Filtros plates of different porosity.

The field tile are not sufficiently uniform in porosity to be used. Basswood blocks ½-inch thick, from 2 to 3 inches wide and 4 to 6 inches long gave most excellent diffusion when first operated. Unless treated with some preservative, they deteriorated rapidly thru fungus growths. Wood must be continually saturated with water to keep it in condition. If for any reason the blocks were allowed to dry, they would fall out of place and spoil the operation. For these reasons they are not to be recommended.

Perforated pipes give good results as long as they are in operation and do not corrode. Many small perforations are necessary, placed close together. Galvanized pipe corrodes very rapidly in this service. If the lines are shut off, the liquor is drawn into the pipes, and upon starting operation it is forced out, leaving the solid matter to clog the perforations in many cases. These pipes have not been found dependable in Milwaukee.

Filtros plates, manufactured by the General Filtration Company, of Rochester, N. Y., are porous plates 1½ inches thick, made up of graded sand and burned in kilns under high temperature. They can be made of any degree of porosity required, are stable in character and are the most satisfactory air-diffusers that have been tested in the Milwaukee Station.

Ratio of Air-Diffuser and Tank Surface

Ratios varying from 1 to 4 to as much as 1 to 10 have been used in the United States and England, the latter inclining toward the greater ratios. The ratio largely depends on the type of aerating tank and on the character of the effluent desired. In a short flowing-thru length a ratio of about 1 to 4 would be more efficient, thus decreasing the chances of short-circuiting the passing liquor, while in a long tank a greater ratio could well be used. The higher the standard of the effluent required, the smaller the ratio. The Milwaukee plant uses a ratio of 1 to 6 where the tanks are 350 feet long and must produce a high standard effluent.

Period of Aeration

The period of aeration largely depends on the character of the sewage to be treated and the effluent to be produced. A mixture of domestic and industrial sewage can be well clarified—that is, to contain not

more than 5 per cent of the suspended solids in the original sewage in one hour's aeration by using from 0.5 to 0.9 cubic feet of free air per gallon of sewage treated. To maintain this clarification, it is necessary to further aerate the sludge removed from and returned to the aerating tanks. This procedure saves air in the end, because the sludge aerated is only from one-third to one-half of the total volume of sewage treated.

To produce an effluent containing nitrates and from 4 to 6 parts of dissolved oxygen, with a reduction of bacteria from 95 to 98 per cent from a mixed sewage, requires from four to six hours' aeration. After little or no advantage obtained from re-aerating the sludge, probably because it is maintained in prime and active condition by the period of aeration above stated.

The effect of changing these various elements is best shown in the tables below.

Period of Sedimentation

The period of sedimentation is closely connected with the period of aeration, assuming that the sewage treated is of similar character. A low period of aeration requires a longer period of sedimentation.

A well-activated or well-aerated sludge will floc very rapidly and will settle out of the liquor at the rate of one vertical inch per minute, whereas poorly aerated sludge flocs slowly. While the period of sedimentation is a factor to be considered, the principal factor seems to be the area provided, as has already been discussed.

From thirty to fifty minutes are sufficient to clarify the sewage, providing the sludge is removed from the settling tank as rapidly as it settles.

Volume of Air Required

The volume of air required depends upon several primary factors: the character and quantity of the organic matter in the sewage, the depth of the aeration tanks, and the character of the effluent required. To some extent the temperature of the sewage below 50° F. also has its influence if continued over a long period.

Inasmuch as the chief expense in operating the activated sludge process is the cost of the power producing the air, the quantity required should be carefully determined in each case and the entire plant designed and operated with a view to reducing the air consumption to the economic limit. The cost of air depends upon its volume multiplied by the pressure. Theoretically, then, it would cost the same to supply an aerating tank 15 feet deep with 1 cubic foot of air under 6.5 pounds pressure per gallon of sewage treated as to supply a tank 10 feet deep with 1½ cubic feet of air under 4.34

DECREASING RATE OF AIR APPLICATION

Hours of Aeration	Cu. Ft. of Air Applied per Minute	Cu. Ft. of Air Applied per Gallon	Per Cent Bacteria Removed	Stability In Hours	Parts Per Million: Free Ammonia	Parts Per Million: Nitrite	Parts Per Million: Nitrate
4	90	1.71	98	120	1.8	0.14	5.2
3	90	1.28	96	95	9.9	0.41	2.9
2½	90	1.40	92	69	11.0	0.05	0.7

DECREASING PERIOD OF AERATION

Hours of Aeration	Cu. Ft. of Air Applied per Minute	Cu. Ft. of Air Applied per Gallon	Per Cent Bacteria Removed	Stability In Hours	Parts Per Million Nitrogen as: Free Ammonia	Parts Per Million: Nitrite	Parts Per Million: Nitrate
4	80	1.8	97.7	120	1.95	0.08	8.5
4	69	1.6	99.6	120	5.79	0.14	9.0
4	46	1.1	88.3	61	7.90	0.02	2.6

COMPARISON OF EFFICIENCIES OBTAINED WITH DECREASING PERIODS OF AERATION COMBINED WITH INCREASING RATE OF AIR FEED

Hours of Aeration	Cu. Ft. of Air Applied per Minute	Cu. Ft. of Air Applied per Gallon	Per Cent Bacteria Removed	Stability In Hours	Parts Per Million: Free Ammonia	Parts Per Million: Nitrate	Parts Per Million: Nitrate
4	1.75	1.75	92.7	120	4.86	0.36	4.9
8	2.34	1.75	91.2	120	9.39	0.60	3.0
2½	2.80	1.75	96.7	84	11.22	0.36	1.1

BACTERIAL REMOVAL, STABILITY AND NITROGEN CYCLES

Hours of Aeration	Air Applied Per Gallon	Bacteria Removed	Stability in Hours	Free Ammonia	Nitrate	Nitrite
0	0.00	0	0	26.1	0.00	0.12
1	0.88	87	72	18.7	0.45	0.80
2	1.78	96	120	15.2	1.50	2.10
3	2.68	98	120	11.6	1.50	4.20

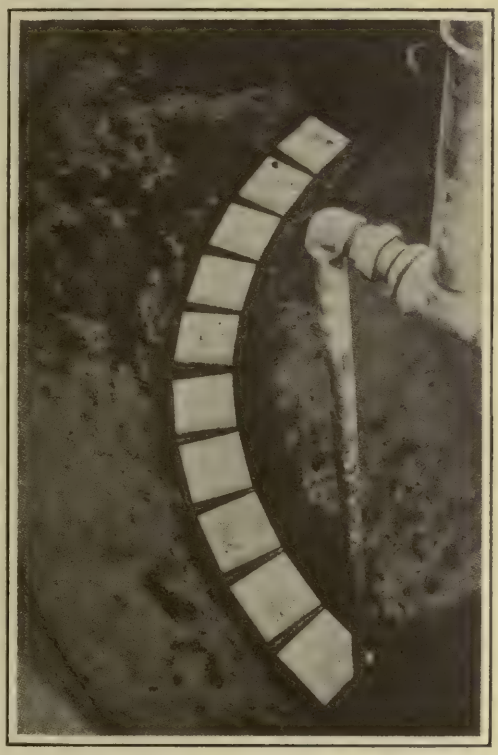
pounds pressure per gallon of sewage treated.

If this ratio of air is equally effective in the depths mentioned, the air supply to the 15-foot tank would be cheaper, because the frictional losses thru the diffusers and air mains would be about the same in either tank. If this theory is extended, the deeper the aerating tank, the cheaper the air supply. From Mr. Hatton's observation, there is another element that influences the ratio of economic depth of tank and air supply. The less the depth of tank, the better the circulation of liquor, the smaller the air bubbles and the greater the saturation.

In observing these phenomena in glass tanks of different depths, it appears that in the deeper tanks the small bubbles released from the Filtros plates at the bottom of the tanks coalesce and become larger bubbles before they reach the surface, while in the shallower tanks this tendency does not seem to be as pronounced. The smaller the bubble, the greater the saturation and oxidation.

There is another factor of cost involved in the ratio of economic depth of tank and air supply. The deeper the tanks, the greater the volume of sewage treated per acre of disposal plant. This means less concrete construction, air piping, valves, fittings, influent, effluent and sludge carriers, and, last but not least, less area of tank bottom containing the air-diffusers. Under average conditions, aerating tanks 15 feet deep would probably prove cheaper than tanks 10 feet deep.

In the Milwaukee experimental plant, from 600,000 to 1,400,000 gallons of coarse screened sewage was treated per day, the flow fluctuating similarly to the changes in flow in the intercepting sewer. The tanks were 10 feet deep, and from 1.76 to 3.50 cubic feet of air was used per gallon of sewage treated, based on monthly averages. This included the air used for pumping the sludge from the sedimentation tanks, and produced an average effluent during the seven months showing 90 per cent removal of bacteria, 95 per cent removal of suspended matter, 80 per cent oxygen consumed, and eighty-eight hours' stability. The aeration period ran from three - and - a - half to five hours and the sedimentation period from twenty-nine to forty minutes.



FILTROS PLATES IN POSITION AT BOTTOM OF AERATING TANK

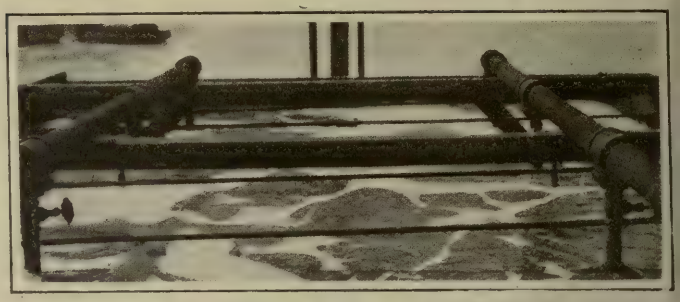
There are 78 of these plates cemented into cast iron frames in each tank

After two months' run with a tank 15 feet deep, thru which the volume of flow was continuous, and with coarse - screened sewage, the temperature of the sewage running from 60° to 70° F., and the suspended matter about 275 p. p. m.,* the same character of effluent was obtained as with the 10-foot tank, with an expenditure of an average of 1.10 cubic feet of air under 7.5 pounds pressure per gallon of sewage treated. In the last-mentioned case, the sewage has been treated at the rate of 21,000,000 gallons per acre of aeration, four hours' detention period and 20 per cent sludge in the aeration tank. The sedimentation area was one acre for 48,000,000 gallons treated.

As a result of the experiments, it is believed that Milwaukee sewage can be suc-

* Parts per million.

cessfully treated to produce an effluent showing 90 per cent removal of bacteria, 95 per cent removal of suspended matter and seventy-two hours' stability by using 1.5 cubic feet of air per gallon of fine-screened sewage in a tank 10 feet deep, and 1.1 cubic feet of air per gallon in a tank 15 feet deep, using from 15 to 25 per cent of activated sludge in the aerating tank. The fine screens used should have from ⅛- to 3/16-inch slots.



CHARACTER OF AGITATION IN A 16-FOOT DRAW-AND-FILL AERATING TANK

About 1.6 cubic feet of air under 5 pounds pressure was being supplied per gallon of sewage when this photograph was taken at the Milwaukee plant

Percentage of Activated Sludge

The percentage of activated sludge in the aerating tanks is not very important within certain limits. In Milwaukee equally good results have been obtained when using from 15 to 25 per cent of activated sludge. It is quite fortunate that this is true, for without extremely close supervision it is impossible to maintain a uniform percentage of sludge in the plant.

For reasons unknown, the accumulation of sludge fluctuates from day to day, and, in fact, from hour to hour, over wide ranges. A day's run has been made several times on a sewage carrying 300 p. p. m. of suspended matter without increasing the amount of activated sludge one per cent, and producing an effluent carrying less than 15 p. p. m. At other times, while treating a similar sewage, from 2 to 5 per cent of activated sludge has been built up in a day.

About 20 per cent of well-activated sludge is all that is required for satisfactory treatment. This percentage is measured in a beaker after one-half hour's settlement, after which the settled sludge contains about 99 per cent moisture.

Volume of Sludge to be Handled

The quantity of sludge to be handled depends largely upon the suspended matters in the raw sewage and the period of aeration given.

During July, August and September, 1916, an experiment was made in Milwaukee to determine the volume of sludge produced by the process. Three distinct runs of one week each were made. During the first run, 5,552,000 gallons of raw sewage were treated and 15 per cent of sludge accumulated in 7.6 days. During the second week, 6,800,000 gallons of sewage were treated without any extra accumulation at the end of seven days. The third week showed an accumulation of 9 per cent of sludge from 6,000,000 gallons of sewage treated.

In July, 1917, a test was made to determine the amount of sludge produced from one of the small tanks treating 4,000 gallons of raw sewage a day under conditions more favorable for accurate observations. This test produced 10.250 gallons of sludge containing 98 per cent moisture per million gallons of raw sewage treated, containing an average of 278 p. p. m. of suspended solids.

Up to 1917 the computations at Milwaukee to determine the weight of dry sludge produced from the process were made according to the formula suggested by George W. Fuller on page 23 of his book, "Sewage Disposal." Several discrepancies having been found when applying this formula to sludge from the Milwaukee tanks, it was thought advisable to ascertain the reduction in activated sludge experimentally. The results are given below.

The sludge, when dried to 10 per cent

SLUDGE SETTLING AND PRESSING

Date June, 1917	Gallons of Sludge: Before Settling	Gallons of Sludge: After Settling	Pounds of Pressed Cake	Percentage of Moisture in Sludge: Before Settling	Percentage of Moisture in Sludge: After Settling	Percentage of Moisture in Sludge: Pressed Cake
11	9,053	1,950	1,743	99.45	98.22	81.70
21	18,106	3,424	2,647	99.45	98.06	72.02
29	16,776	2,739	2,181	99.50	98.20	74.90
Averages.....	14,646	2,706	2,190	99.47	98.16	76.21

moisture, amounted to 25 per cent of the weight of the pressed cake. From the above table, 1,640 pounds of dried fertilizer containing 10 per cent moisture were produced, whereas by Fuller's formula there should have been 2,034 pounds. Basing assumptions on these experiments, plans for the final plant at Milwaukee call for a production from each million gallons of raw sewage treated; 55,565 gallons of sludge containing 99.5 per cent moisture; 10,250 gallons containing 98 per cent moisture; 8,305 pounds of pressed cake containing 76 per cent of moisture, and 2,076 pounds of dried sludge containing 10 per cent moisture.

The volumes of sludge given above are the result of probably more investigation than has ever been devoted to this important topic in any other city.

(*To be continued*)

What Place Will Your City Hold in the New Liberty Loan?

A Special Appeal to City Officials, Chambers of Commerce and Other Readers of The American City from the Publicity Department of the Liberty Loan Association

The United States Government is about to offer the cities of the country a a third great opportunity to pit themselves against one another in patriotic rivalry. It is a rivalry in which each city's service to its country can be set down in plain figures and compared without question with the achievement of every other city. Whatever controversies may rage about some phases of war activities, men of all parties, all business interests and all faiths can unite on the proposition that, now that we have given so generously of our sons for the cause of human liberty, the all-commanding duty is to supply the means to make them the most efficient fighting men in the world, in military training, physical fitness and battle equipment. It is in rivalry to perform this duty that the cities are again to be pitted against one another.

The Government will soon ask the country to make a third Liberty Loan. There is a very definite way in which every mayor, every chamber of commerce, every responsible public man or organization in the cities, great and small, can assure that this third Liberty Loan shall be just as staggering a blow to the Germans as a successful military campaign against them. In the first and second Liberty Loans each city was given an allotment of Liberty Bonds it was asked to buy, and in both loans each city's response bore a definite relation to its allotment. Some of them fell below their allotment, some just about equalled it, some exceeded it and some snowed it under in a deluge of dollars far in excess of what they were asked or expected to give.

With the approach of the third Liberty Loan, there can be no greater patriotic service for every mayor to render his city and his country than to study the figures of what his city did in the first two loans. If his city fell below its allotment, and thereby below its opportunity for patriotic service, in both or either of those loans, what greater service can the Mayor perform than to call his fellow citizens' attention to this fact and issue a proclamation bestirring them to make it their foremost public duty to obliterate their city's previous dereliction beneath a triumphant over-subscription to the coming loan? Most people have a chance to do a thing only once, and then the golden opportunity is lost if they fail to do it well; sometimes, but not often, we get a second try; but here we are to have a third chance to make good in Liberty Loan work.

To the mayors, chambers of commerce and citizens of all American cities the same suggestion applies. Those who barely met their allotment should reach higher levels this time; those that exceeded theirs should beware lest they fall down; and those that attained the pinnacles of over-subscription must fight hard to maintain their proud eminence. Every mayor has a tocsin to sound, and that is: "Beware your laurels in the third Liberty Loan!"

Letters to the Editor

Charles Mulford Robinson

To the Editor of The American City:

If it is permitted, I should like to express thru the columns of The American City the loss which all of us who are deeply interested in the town and city feel in the passing away of Charles Mulford Robinson, whose death occurred at Albany on December 30.

The city was to him a life study. Countless communities have been helped and encouraged by his writings or by his direct advice. He began the publishing of articles on the town and city at a time when scientific town improvement was a new topic. Some of his best known books are, "The Improvement of Towns and Cities," "Modern Civic Art," and his recent "City Planning."

Mr. Robinson was appointed Professor of Civic Design at the University of Illinois in 1913. From that time until this winter he conducted an inspiring spring and fall course at the university, the influence of which has been far-reaching.

Besides being a remarkable writer and teacher in his chosen work, Professor Robinson attained prominence in professional practice as a city planner, having been employed to advise communities upon phases of city planning in many places thruout the country. His methods as a city planner were marked by quiet thoroness and reserve force. His recommendations for each piece of work undertaken were embodied in a well-ordered report to the city or the commission which employed him. His methods seemed to suggest that, tho elaboration and outward show in city building might have its place, true city planning would better begin with something closer to the lives of the citizens.

Professor Robinson will be greatly missed as a teacher, a city planner, and a man, in the highest sense of the word. His memory will be a lifelong inspiration to all who knew him.

Frederick N. Evans,

Assistant Professor of Landscape Gardening, University of Illinois.

Urbana, Ill.

Favors Town Manager Form of Government

To the Editor of The American City:

In your December issue I am recorded as answering the first three of the following questions in the negative; the fourth, unfavorably:

(1) Is the operation of commission-manager government in your city successful?

(2) In your judgment are the majority of people pleased with it?

(3) Do you think that it has improved conditions from what they were before the new charter of your city was adopted?

(4) What is your personal opinion of the principle of this form of municipal government?

I am, therefore, asking that you publish the following letter sent by me under date of January 12, 1918, to the Chamber of Commerce at Steubenville, Ohio:

"It appears that my answers under date of January 10, 1917, to a questionnaire sent out by your Chamber of Commerce in regard to our town manager form of government have led to a misinterpretation of my point of view. I am, therefore, asking that you file this letter with the original questionnaire, so that your records may more completely express my views.

"The opinions I held last January were (1) The town manager form of government was successful; (2) I did not know enough about the views held by different people to form a definite judgment on the question of whether a majority of the people were pleased with the town manager form of government (3) The town manager form of government undoubtedly had improved conditions; (4) was in favor of the principle of the town manager form of government.

"Because I can see both sides of a question and because I tried to be fair in stating both sides to your Chamber of Commerce, it does not follow that I wished to be understood as answering your questions in the negative. I may add that events which have taken place during the past year have dispelled doubts I had a year ago and have led me to a greater appreciation of the success of the town manager form of government. Furthermore, I believe that there has been a distinct gain in sentiment among our people in favor of the town manager form of government during the past year."

Yours truly,

Austin H. Fittz,

Superintendent, School Department, Norwood, Mass.

FORWARD STEPS
REPORTED TO THE AMERICAN CITY BY MUNICIPAL OFFICIALS & DEPARTMENT HEADS

MAYORS

New Attractive Concrete Lamp Standards

MASON CITY, IOWA.—City beautification has taken many different forms in various cities. In Mason City, among many other pieces of work in this line, we have replaced our old iron standards with cluster lights, with attractively molded concrete standards.

The former lighting standards carried five-cluster lighting units of a total of 340 candle-power, and cost the city $48 a year for current. The new lighting system carries Novalux units using 400 candle-power nitrogen lamps. These cost $43 a year for illumination until eleven o'clock; those at the street intersections burn all night and cost $53.

NEW CONCRETE LIGHTING STANDARD IN MASON CITY, IA.

The new standards which have attracted so much attention in Mason City are ten feet high and cost approximately $18, exclusive of the electric fixture. The feature of the standards which causes most favorable comment is the use of feldspar in the concrete mixture. The brilliant particles sparkle in the sunlight or under the bright lamplight with beautiful effect. The standards are reinforced with four ½-inch bars located in the flutes seen in the accompanying illustration.

The substitution of the concrete posts for the iron ones in Mason City was made for several reasons; the older posts needed replacing, as they were out of date; the concrete posts are very durable, and the addition of the feldspar to the aggregate for the concrete has increased the beauty of the post, making it an adornment for any thorofare.

TRUMAN A. POTTER,
Mayor.

CITY ENGINEERS

Concrete Alleys a Success in Johnstown

JOHNSTOWN, PA.—Modern cities call for permanent hard-surfaced streets thruout the business and residential sections of the city, but it often happens that the alleys thru which a great portion of the market delivery travels are neglected. An unimproved alley is a source of many evils. Mud seems to have an affinity for all kinds of rubbish; who has not seen muddy alleys acting as rubbish barrels for the community thru

ONE-COURSE CONCRETE ALLEY EAST OF CLINTON STREET, JOHNSTOWN, PA.

which they pass? This state of affairs can be done away with very rapidly if the alleys are put in as good condition as the front streets. Concrete has solved this problem in Johnstown, where the conditions were far from being as bad as in some cities.

The first concrete alley in Johnstown was built in 1915, and this served to demonstrate the success of the method, so that in addition to the 1,603.5 square yards of one-course concrete laid in alleys in 1915, there were 6,805 square yards laid in 1916 and about 1,700 in 1917. The prices ranged from 50 to 75 cents per square yard less than for asphalt or brick on a concrete base.

The owners of property looked upon the initial work as more or less of an experiment, but concrete paving in streets or alleys had passed beyond that stage before Johnstown took it up. There was some idea of using the other materials mentioned above, but it was decided that concrete was best suited to all local conditions on account of durability, moderate first cost, ease and cheapness of maintenance, sanitary qualities, ease of cleaning, appearance, and eas of traction. In view of these factors th choice of concrete has proved well-founde in the three years it has been in use. T date not a cent has been expended fo maintenance.

Particular attention is paid to the mate rials going into the make-up of the pave ment, only good aggregates and rich mix tures being used, with careful workman ship. The municipal specifications permi the use of any metal fabric for reinforcing providing it has a cross-sectional area o 0.033 square inch per foot of pavemen width and 0.066 square inch per foot o pavement length. Expanded metal has bee found to be the material most used for thi work by the contractors. To prevent un due wear at the joints, use is made of stee protection plates of soft metal measurin 2½ by ⅛ inches. A filler of premolde elastic felt ¼-inch thick, extending the en tire thickness of the pavement, is place between the plates. This combination ha given very satisfactory service. By wa of experiment this coming year, it is pro posed to lay some pavement without th steel plates at the joints, using only th elastic felt. The specifications call for ex pansion joints every 24 feet, and this lengt has been used in all previous work, but i the future it is planned to change the lengt between expansion joints to 30 feet.

Property owners have accepted this ne system of alley-paving as a great improve ment over any previous methods. In 191 the system of assessment now in use wa instituted, the front-foot plan; before tha date all paving was paid for out of a fun appropriated each year for this kind of in provement work. At present only the ex pense of repaving and repairs is paid d rectly by the city.

J. R. CRISSEY,
City Engineer.

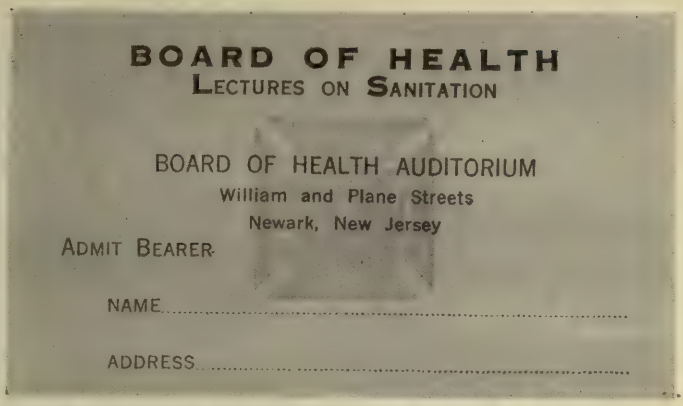
HEALTH DEPARTMENTS

A Doubly Effective Course of Public Health Lectures

Newark, N. J.—The Department Health of the city of Newark has institut a series of public lectures on matters health and sanitation for the benefit of

wn employes, as well as or the public. The series vas started in response to growing demand for uch information on the art of social workers, eachers and others interested in sanitation and ealth conditions thruout he city.

The course was simulaneously announced in ne monthly bulletin of the Board of Health, and by a ircular letter, the text of vhich follows:


BOARD OF HEALTH
LECTURES ON SANITATION

BOARD OF HEALTH AUDITORIUM
William and Plane Streets
Newark, New Jersey

ADMIT BEARER

NAME.....

ADDRESS.....

ADMITTANCE CARD ISSUED BY NEWARK BOARD OF HEALTH FOR PUBLIC HEALTH LECTURES

EAR SIR:

The present widespread desire for modern ublic health education and the national emerency which may require many of our public ealth officials to be detailed for service both our country and abroad, have induced the oard of Health to open its school of instruction to the public and to prepare a course of eekly lectures which will serve a twofold urpose—the creation of a reserve of volnteers trained in public health work, and to atisfy the public mind for knowledge of modn sanitation.

The subjects dealt with will cover every ranch of sanitation, hygiene and preventive edicine, and opportunities for field work in e different divisions of the Board will be fforded those who volunteer.

This course of lectures will be free to all, nd it is hoped will become popular as well as sential among those already occupied in edutional and welfare work, such as school achers, sanitary inspectors, nurses and emoyes of social agencies and city departments.

It is intended that the course cover a period f two years, and all those who have attended per cent of the lectures and can pass an camination on the subject matter will be entled to a Certificate of Proficiency in Sanity Science.

An outline of the lectures for the first year enclosed. The first lecture will be given on onday, October 1, 1917, at 4 P. M.

Admission cards to the lectures will be ised upon application to any person who regisrs with the undersigned at the Board of ealth Building, William and Plane Streets, ewark, N. J.

Very truly yours,
CHARLES V. CRASTER, M. D., D. P. H.,
Health Officer.

This letter shows the general scheme of ork, including the novel feature of a twoars' course with an examination for those ho have attended 75 per cent of the lecres; the examination, if satisfactorily ssed, leading to a certificate of Proiency in Sanitary Science.

The lectures are given weekly in the autditorium of the Department of Health Building from October to May, at 4 P. M. As seen from the complete program given at the end of this article, the subject is covered in a thoro but necessarily elementary manner. It is planned to raise the standard of the lectures for the second year and make them slightly more technical. The speakers are selected from the heads of the different divisions of the Board of Health and from other city departments, especially the departments of Public Works, Buildings and Education. Lantern slides are used wherever the speaker desires, and questions are sought and answered after each lecture.

A class of between eighty and ninety attend each lecture, and in addition to the social workers and teachers for whom the lectures were primarily intended, we have taken the opportunity of requiring the attendance of our sanitary inspectors and inspector nurses. The public is thereby doubly benefited by the course, for the efficiency of the department is increased by the continued education of its workers.

The complete program for the course for 1917-1918 is given below for the benefit of those who may be looking for suggestions for starting similar courses. It is my hope that they may be able to arrange even better programs for their courses.

Physical Geography and Local Geology—Two Lectures, October 1 and 8, 1917.
Old Water Courses, Economic Geology, Building and Road Materials, Clay, Sand, Quarries, Old Sidewalks, Mica Schist, Dendrites, Ripples, Calamities.

Chemistry—Three Lectures, October 15, 22 and 29, 1917.
Putrefaction, Fermentation, Combustion, Com-

pressed Air, Water, Analysis, Synthesis, Transformation, No Destruction.

Bacteriology—Three Lectures, November 5, 12 and 19, 1917.
Bacteria, Vaccines, Toxins, Antitoxins, Amphlaxis, Pollens, Immunity, Organo-Therapy.

Nuisances, Sanitary—Two Lectures, November 26 and December 3, 1917.
Noises, Smoke, Police Ordinances, Chickens, etc.

Municipal Waste—Two Lectures, December 10 and 17, 1917.
Street Sweeping, Rubbish, Garbage, Dead Animals, Smoke, Paper, Rendering, Sewers.

Sewage Disposal—Two Lectures, December 24 and 31, 1917.
Municipal, Rural, Suburban, Septic Tanks, Earth Closets, Board of Works.

Water-Supply—Two Lectures, January 7 and 14, 1918.
History, Aqueduct Board, Board of Works, Sources, New and Old, Description, Mineral Springs, Chemistry, Biology.

General Subject—Six Lectures, January 21, 28, February 4, 11, 18 and 25, 1918.
Personal Hygiene, Housing, Building Regulations, Tenements, Ventilation, Heating, Plumbing, Bath Houses, Meteorology, Soils, Soil Formation, Physical Character.

Public Utilities—One Lecture, March 4, 1918.
Gas, Electricity, Water, Transportation, Jitneys, Amusements.

Disposal of Dead—One Lecture, March 11, 1918.
Permits, Embalming, Earth Burial, Cremation, Anatomy Laws, Mortuary Customs, Insurance.

Institutional—One Lecture, March 18, 1918.
Municipal Laboratories, Hospitals, Private Hospitals, Institutions, Prisons, City Beds, County Institutions.

School Inspection—One Lecture, March 25, 1918.
Regulations, State and Local, Methods, etc.

Food and Drugs—Three Lectures, April 1, 8 and 15, 1918.
Federal, State and Local Laws, Definitions, Pure Foods, Adulterants, Standard Condiments, Poison Laws, City, Harrison Act, Special Local Ordinances, Carbolic Acid, Microscopic Examination of Foods.

Milk—Two Lectures, April 22 and 29, 1918.
Laws, Federal, State and City, Bacteriology, Adulterants, Standards, Inspection, From the Farm to the Bottle, "Chemistry-Laboratory."

Social Hygiene—Two Lectures, May 6 and 13, 1918.
Eugenics, Baby Protection, (Laws) Child Hygiene Department.

(End of First Course, 1917-1918)

CHARLES V. CRASTER, M. D., D. P. H.,
Health Officer.

PARK DEPARTMENTS

Ice Rinks for Everyone

Calgary, Alberta, Can.—It has been the ambition of the Parks Department of Calgary to provide ample facilities thruout the city for everyone who enjoys skating and ice games. A beginning was made in 1913, when large rinks were established in five of our parks. In 1914, at the request of the School Board, we took charge of the flooding of all the public school rinks in the city. These have been used chiefly for hockey, but the larger spaces in the parks have provided ample opportunity for general skating.

In addition to the rinks, we have, on several occasions, cleaned large stretches of ice for skating on the river—some of them over a mile and a half long. So popular have these long skating areas proved that large crowds of people throng to them during suitable weather, much to the benefit of the revenue of the street railway system. Where facilities were available, we have also established dressing and checking rooms, for which accommodations a nominal charge is made.

The school rinks are provided by the school authorities, and each school of eight rooms or more has had its own hockey rink, with a board fence 4 feet high and iron goal posts. Some of the smaller schools have rinks with low sides, from 12 to 15 inches high. It is the opinion of the school authorities that these rinks have been a good investment, for the boys and girls are thereby provided with facilities for organized supervised sport thruout the winter season instead of wasting their time on the streets.

There is an interscholastic hockey league which is composed of fifty boys' teams, each team playing from four to six games during the season. These boys are between the ages of twelve and eighteen years, a very important period in a boy's life. They are taught the principles of good sport, fair play, coöperation and team work. In addition to the regular games played in the league, there are numerous friendly games between the different schools and between teams in the same school. The boys are expected to help maintain the rinks by shoveling the snow from the playing surface and sprinkling the ice when necessary. The body of ice is formed in the first place by flooding the area with a fire stream from the nearest fire hydrant.

Photographs of the skating rink provided at Hillhurst Park football grounds, of a Boy Scout hockey team which were contenders for one of the championships, and of the toboggan slide at Riley Park, reproduced on the following page, show some of the winter activities provided.

WILLIAM R. READER,
Parks Superintendent.

A Community House Always Open

Topeka, Kansas.—The city of Topeka recently acquired a tract of land of 25 acres for park purposes. This new park area is bounded on the west by Lawrence Street, on the north by the Santa Fé main line and

HILLHURST PARK FOOTBALL GROUND CONVERTED INTO A SKATING RINK; THE TOBOGGAN SLIDE AT RILEY PARK, AND A BOY SCOUT HOCKEY TEAM, CALGARY, ALBERTA, CANADA

shops, on the south by the Shunganunga Creek and on the east by a new addition. The east and west ends of the area contain beautiful groves of stately trees, while the north and south ends are fringed with trees and undergrowth, leaving an open, almost level center. Here are located the baseball diamond, tennis courts and running track, with the community building and the swimming pool on the south overlooking the playfields.

The west grove, adjoining Lawrence Street, contains a complete set of playground features and a wading pool, and the east grove is a picnic ground with tables, benches and camp stoves.

The Community Building and the adjoining outdoor swimming pool were built this last summer at a cost of $23,000, of which the Santa Fé Railway donated $15,000 thru its president, E. P. Ripley, for whom the park is named. The building is a two-story structure of burnt brick with gray and wine trimmings. The interior is divided into a large gymnasium, with a balcony, a reading and committee room, and shower-bath apartments for both boys and girls. The rooms are complete with hammered brass fixtures with invisible lights.

The building will serve many persons in numerous ways and will supply a much-needed community center to East Side Topekans. It will be open to the public at all times, and in it will be a branch of the city library and a branch of the city Y. M. C. A. offices. It will serve as headquarters for all community meetings, such as parent-teachers associations, welfare societies and organizations of similar nature.

The gymnasium room is floored with maple and will be used for both basket-ball and dancing. The big play room will be equipped with gymnasium apparatus and will make an ideal playhouse for the youngsters of the community. The large balcony, which completely encircles this room, will furnish ample seating capacity for onlookers at games and dances.

The large cement swimming pool approaches perfection in safety and sanitation. It is oblong in shape and shallow around the sides, slanting from all directions to the center. When full, it contains 350,000 gallons and measures 9 feet deep at the center. Fresh water runs into the big basin all the time it is in use.

This park and community house fills a long-felt want, as it serves one of the most densely populated sections of the city, composed chiefly of shop workers and their families.

E. F. A. REINISCH,
Superintendent of Parks.

COMMUNITY BUILDING, RIPLEY PARK, TOPEKA, KANS.

PUBLIC WORKS DEPARTMENTS

The Park that Perseverance Built

Corning, N. Y.—The history of Denison Park, one of the most attractive playground areas in the East, speaks thruout of the

A FLOWER BED OF CANNAS, DENISON PARK, CORNING, N. Y.

determination of the citizens to have a beauty spot within their gates. As far back as 1906 the Business Men's Association and other groups of citizens decided that Corning should have a large recreation area. An appropriation was made and 33 acres of the Johnson estate were purchased for $8,400.

The Business Men's Association appointed a Park Committee for the purpose of securing subscriptions to pay for the plans and putting them into effect. About $6,700 was secured thru private subscriptions, but, unfortunately, this was not enough to carry out the work after paying the landscape architect who drew the plans.

MAIN DRIVE IN DENISON PARK
Top of water-works pumping station in distance

A mortgage was taken on the property, and sufficient funds were thereby made available for the work. The work was started in May, 1907, and a portion of the preliminary excavation and grading was completed, when the available funds gave out. Charles L. Denison, of New York City, a former resident of Corning, offered to assume the mortgage and to advance $5,000 for continuing the work. At that time it was suggested that the new park be named in memory of his father, Charles G. Denison, a long-time resident of the village of Corning, who had left behind him an honorable record both as a private citizen and a public servant. The Park Committee acted favorably on the suggestion, and the name Denison Park was bestowed on the former People's Park.

By agreement between Mr. Denison and the Board of Public Works, the Business Men's Association turned over the park to the city of Corning for the pleasure and use of its citizens.

Denison Park is located in the eastern part of the city, on the highway between New York and Buffalo along the Chemung River. There is a broad driveway encircling the park and lake, banked on both sides with trees, shrubs and flower gardens. This main driveway leads to a boulevard along the Chemung River. The center of the park is laid out as a common with attractive flower beds and shrubbery. The athletic field, which has a quarter-mile track, a baseball diamond and tennis courts, is located in the northwestern part of the park, and the children's playgrounds are located in the southwestern section.

The present buildings for the use of citizens are a large pavilion, a band-stand, a comfort station and a boat-house. The lake within the park has an area of about eight acres with eight islands. These islands are reached by attractive concrete, steel and rustic bridges. In the summer the lake affords opportunity for canoeing, and in winter skating is the chief sport.

Located near the municipal water-works at one end of the park there was formerly a large wading pool for the children, but it was found that seepage from the pool contaminated the wells nearby, so the pool was given up and a bed of perennial flowers was placed there instead. Next year it is expected that a large swimming pool for both children and adults, with bath-houses, will be built to replace the old wading pool.

The annual maintenance of the park costs about $5,000. Last year new playground apparatus was installed, and last summer a pavilion costing $2,500 was erected on the old playground. The average attendance at the park was about 300 a day, and during the summer there were 317 picnics.

W. O. DRAKE,
Superintendent of Public Works.

PUBLIC WELFARE - AND SERVICE -

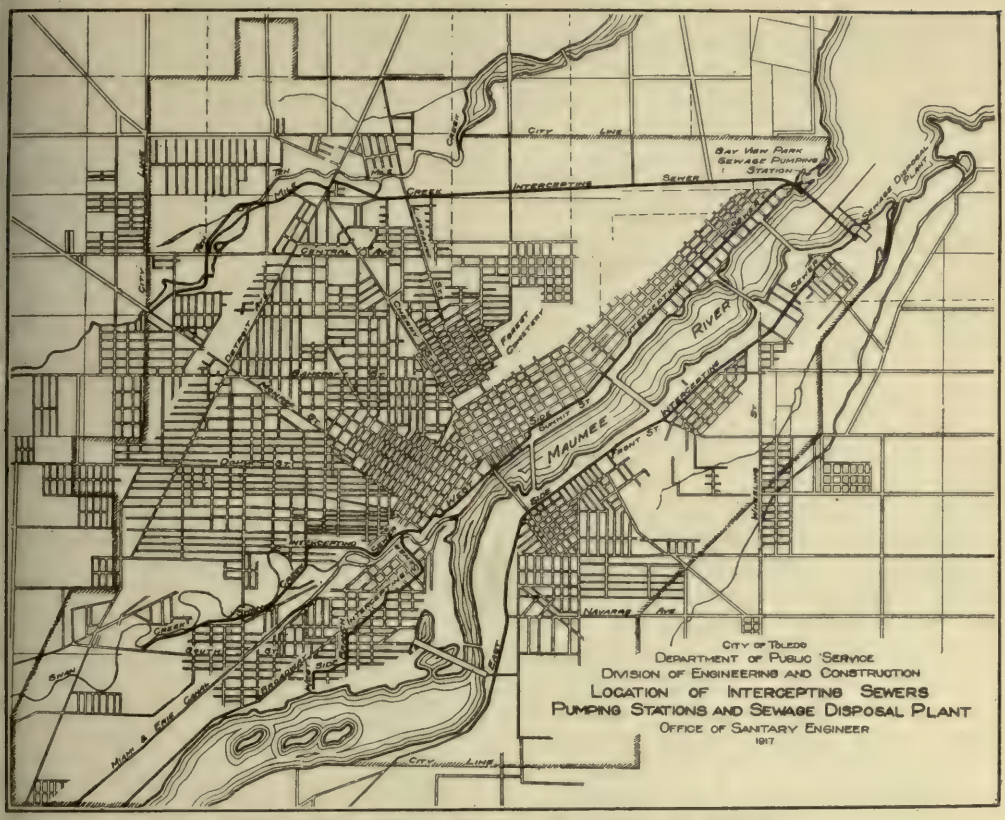
Toledo Starts Comprehensive Sewerage Work

Toledo, O.—The proposition of a comprehensive sewerage system for Toledo adequate for the needs of the city until the year 1960 has been favorably passed on by the voters of the city. On November 6 a bond issue for $2,800,000 for sewers and sewage disposal was passed.

Complete plans for this system call for the construction of about 20 miles of sewers, two pumping stations and a complete disposal plant. The type of disposal works which has been recommended includes Dortmund tanks, sludge digestion sludge beds and chlorination of effluent if necessary. As soon as the necessary bond legislation is completed, the first block of bonds, of $800,000, will be put on the market for the construction of 6 miles of sewers, one pumping plant and a small experimental plant. Sufficient data for the final design of the plant will have been secured long before the sewers are completed and the plant is needed.

The Ten Mile Creek interceptor will consist of about 3 miles of 48- to 72-inch sewer in open cut with the interceptors and siphons, and another 3 miles of 72-inch sewer in tunnel. The pumping plant will be large enough to accommodate centrifugal pumps with 115,000,000 gallons daily capacity. At the present time pumps for only 50,000,000 gallons daily capacity will be installed. The building will be of fireproof construction, with brick and cut stone exterior and tile roof.

The accompanying illustration shows the location of the vast sewerage system



THE NEW SEWERS TOLEDO IS ABOUT TO BUILD

planned for Toledo, as well as the site for the disposal plant.

H. C. McCLURE,
Commissioner of Engineering and Construction, Department of Public Service.

"New Lamps for Old" Releases Copper Wire for New Services

Richmond, Va.—The value of close study of lighting systems has been well exemplified in Richmond, where for the last five years we have watched with great care the performance of the old and the new style street lamps. By showing that the older types required more current and by substituting new incandescent lamps for them, we have been able to consolidate circuits and release large quantities of copper wire for new construction.

The municipal lighting and water plant has been operating for five years, and during this last year the total cost of service, including interest and depreciation, was $92,092; of this sum $80,660 was for lighting service. The difference is for power supplied to the water department.

The city has been substituting incandescent lamps for the old arc lamps, but at the end of 1916 there were 788 500-watt enclosed carbon lamps and 139 "flame" arc lamps in service. During 1917 all of these have been replaced with incandescent lamps. The smaller power consumption of these newer type lamps and improved methods of distribution have enabled the city to consolidate many of the circuits and shift the copper cables, which are now very valuable, to new work. A careful record of the operation of every lamp connected to the city lines has been kept, and the records show that the incandescent lamp far surpasses the enclosed arc or flame arc lamps, judging by failures during lighting hours. The average incandescent lamp was out once in 310 nights, the enclosed arc lamps on an average of once in 214 nights, and the flame arc once in 72 nights.

An effort was made to learn the length of time during which the incandescent lamps furnished satisfactory service. A number of lamps of which we had an accurate record were sent to the United States Bureau of Standards for photometric and efficiency tests. The reports from that reliable source showed that the average candle-power had been maintained within recognized limits of good service, regardless of the length of time during which the lamps had been burned. From this it is reasonable to conclude that the lamps may be allowed to remain in service until they burn out, without incurring any serious loss.

Tests of this type enable any city to show its citizens that the work of the lighting department is being satisfactorily and efficiently prosecuted; and where such saving as the release of copper wire for other service is made possible in these expensive times, there is reason for the official to take pride in the work.

E. W. TRAFFORD,
City Electrician.

✣ ✣

An X-Ray of Baltimore's Streets

Baltimore, Md.—Few people realize the enormous number of mains which must be installed and maintained for the distribution of gas, water and heat, for adequate high-pressure fire protection, for sewerage and drainage. Still fewer realize the magnitude of the electric conduit system by means of which the current for lighting and power, as well as the telephone, telegraph, street railway and other numerous systems, is safely conducted thru underground cables instead of along unsightly and dangerous overhead wires on the public thorofares.

Baltimore was one of the first cities in the United States to inaugurate a vast municipally owned commercial system of underground conduits to effect the removal of the wires from the streets. Since 1899 the city of Baltimore, thru its agent, the Electrical Commission, has been actively engaged in constructing this comprehensive electrical conduit system, and some idea of the work accomplished may be gained when one realizes that the 17,000,000 feet of duct in this underground system would reach from Baltimore to "Somewhere in France" if laid end-to-end.

The cost of this very useful system has been about $5,225,000 to date, but this figure represents only a very small part of the value of the equipment that has been installed in the conduits. There are twenty-three companies and eight municipal departments which use the conduit system for a great variety of purposes. These cables carry current from a few volts to as high as 13,000 volts, and approximately 131,000 horse-power is transmitted thru the system daily.

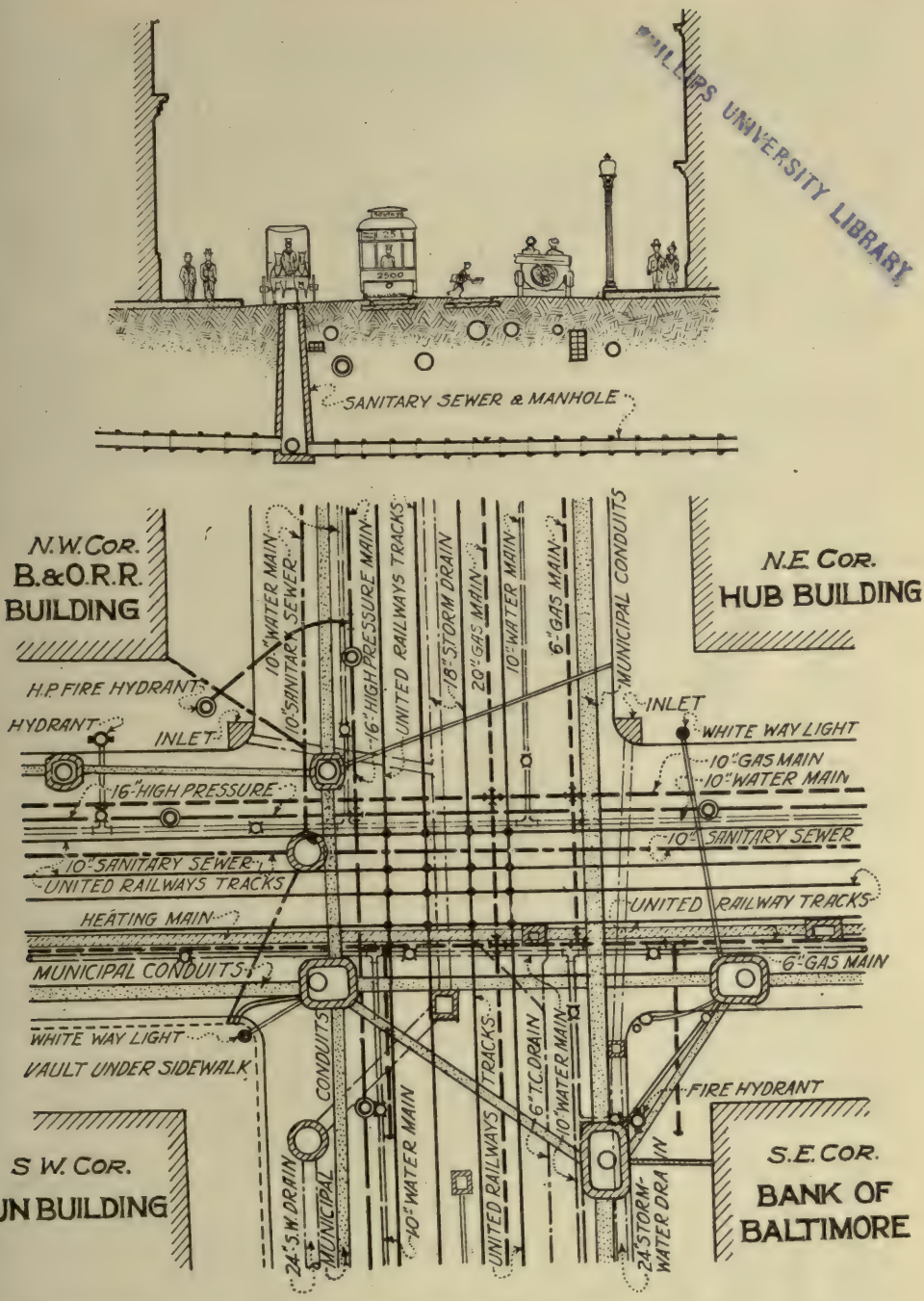
The following table shows the amount of conduit built and in use for each year since it was started, and the revenue from the system. The municipal departments have the use of the unoccupied duct space free

Year	Total Duct Ft. Constructed	Total Duct Ft. Occupied	Per Cent Occupied	Annual Revenue
1898-99	1,602,693.20	7,861.11	.49	.....
1900	2,307,713.40	106,779.09	4.63	$80.00
1901	3,143,153.70	236,266.72	7.52	6,256.53
1902	3,767,833.60	470,154.20	12.48	11,858.48
1903	4,141,275.40	708,152.44	17.10	34,076.19
1904	4,558,632.10	853,948.91	18.73	32,385.71
1905	5,310,672.90	1,246,443.00	23.47	47,410.74
1906	5,961,878.20	1,536,164.86	25.73	64,389.16
1907	6,506,242.80	1,795,551.36	27.60	80,445.03
1908	7,251,803.20	1,867,034.62	25.76	87,397.33
1909	8,129,446.00	1,967,320.20	24.20	91,871.36
1910	9,184,570.80	2,317,417.50	25.23	96,857.91
1911	9,981,432.10	2,631,151.64	26.36	113,024.57
1912	10,514,012.80	2,673,253.40	25.43	120,267.50
1913	12,143,392.00	2,888,360.40	23.79	120,800.46
1914	13,749,809.10	3,358,613.17	24.43	135,476.75
1915	15,297,851.40	4,197,502.62	27.44	172,905.78
1916	15,814,257.70	4,470,755.35	28.27	190,021.73

After 1922, when the first conduit loan expires, the sinking fund and interest charges will be greatly reduced, and the system will become self-sustaining. To this great municipal conduit system must be given credit for reducing the fire losses thruout the city, for overhead wires no longer hinder the firemen in their work.

The accompanying illustration, prepared by the Bureau of Drafting, shows not only the conduit system, but the vast under-

PHILLIPS UNIVERSITY LIBRARY

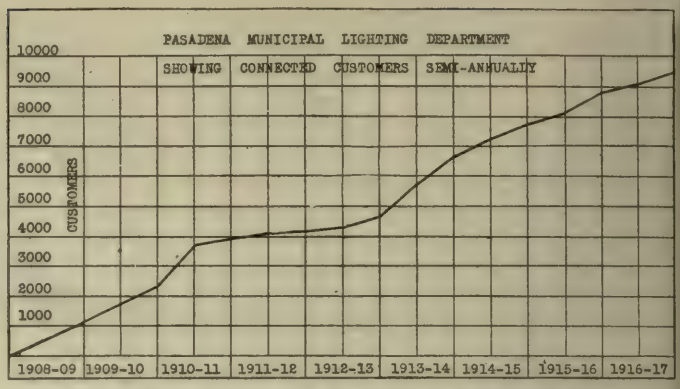


PLAN SHOWING UNDERGROUND STRUCTURES AT INTERSECTION OF BALTIMORE AND CHARLES STREETS, BALTIMORE, MD.

ground system of pipes and structures which are found at nearly every down-town street corner. To make the illustration easier to understand, several obsolete underground structures have been omitted.

RALEIGH THOMAS,
Chief Engineer, Electrical Commission.

Municipal Lighting Plant Shows Gains in Face of High Costs



THE MUNICIPALLY-OWNED LIGHTING PLANT HAS RAPIDLY EXPANDED

Pasadena, Cal.—In spite of the increased cost of materials and supplies entering into the operation of the municipal lighting department, the net results this year are a little better than for the previous year, which was the best since the plant was first operated by the city, in 1906-1907.

Our present plant and field equipment includes 2,213 horse-power in Babcock & Wilcox and Stirling type boilers; 2,000 horse-power in cross-compound condensing engines; 6,200 horse-power in Parsons type steam turbines, and a total generating capacity of 8,000 horse-power. The pole line consists of 6,415 poles ranging from 25 to 70 feet in length, and our service connections number 9,257.

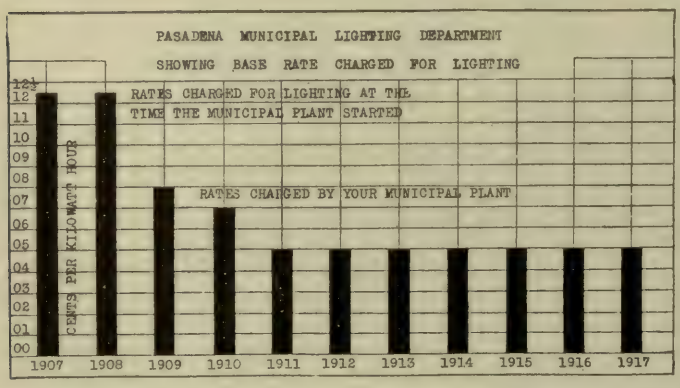
The increased number of house connections to our lines has shown the appreciation of municipal service over private companies. If it had not been for the great increase in the price of fuel oil, our results would have been better for the last year. The increased volume of business, however, enabled the department to keep down operating expenses within reason. The increases and decreases in the various elements making up the income and expenses of the department are shown in the following table:

Increases and Decreases

	1916-17 Over 1915-16 Per Cent	1915-16 Over 1914-15 Per Cent
Commercial light receipts increased	14.97	11.76
Commercial power receipts increased	33.49	18.17
By deducting the sales to the Water Department and the city of Los Angeles, the power receipts increased	20.21	15.33
Street lighting receipts increased	6.77	4.46
Gross receipts increased	16.01	10.82
By deducting the sales to the Water Department and the city of Los Angeles, the gross receipts increased	11.94	10.24
Net receipts increased	10.16	16.06
Output in K.W.H. sold increased	23.91	15.21
By deducting the sales to the Water Department and the city of Los Angeles, the output in K.W.H. sold increased	7.69	9.80
Total cost of current sold decreased	9.45	2.69
Number of consumers increased	8.93	13.84
Surplus increased	32.29	5.65
Price of fuel oil increased	54.00	....

Last year this department succeeded in paying off the final debts on the $40,000 loan which was extended to it some time ago. In order to be able to extend facilities whenever needed, about $25,000 in stock has been carried in excess of the amount which would be carried in normal times.

The attention of those interested in municipally operated lighting plants is called to the net saving resulting to the citizens of Pasadena since the municipal light and power plant was first operated. This saving is estimated on the difference between the rates charged before the city entered the light and power business and



WHILE EXPANDING, THE LIGHTING DEPARTMENT HAS BEEN ABLE TO REDUCE THE BASE RATE FOR LIGHTING

the rates charged in neighboring cities since then, omitting Los Angeles. Last year the saving was estimated to be a total of $1,079,083.96, and by adding the saving for the past year, calculated in the same way, on the number of kilowatt hours sold, a total sum of $1,280,700.06 has been saved for the citizens of Pasadena. This sum is considerably more than the original cost of the electric system. The plant and system are intact and in operation, and in the possession of the people, and are earning all charges that can properly be entered against the property, besides leaving a safe margin to cover emergencies.

The cost of street lighting has been greatly reduced, resulting in a large saving to the city. The average rate per kilowatt hour for street lighting for the last year was $0.04036. The average rate per kilowatt hour for residence and commercial light for the last year was 4.885 cents. Since the department began, the street illumination by electricity has increased 1,003.5 per cent, while the cost of street lighting has increased 233 per cent.

The two charts reproduced herewith show the number of customers connected semi-annually for a series of years and the base rate charged for lighting before and after the lighting was done thru the municipal lighting department.

C. W. KOINER,
General Manager, Municipal Lighting Department.

St. Paul's Municipal Bank

St. Paul, Minn.—In the early summer of 1914, the city of St. Paul experienced difficulty, owing to unfavorable market conditions, in disposing of its paper, both short- and long-term. The Sinking Fund Committee, composed of the Mayor, the Comptroller and the Commissioner of Finance, therefore conceived a plan whereby the small investor would be enabled to purchase a participating interest in the city's finances by means of participating certificates of indebtedness in denominations of $10 and upward, bearing 4 per cent per annum, payable semi-annually. On July 1, 1914, the "City Bank," so-called, was put in operation and immediately became a very popular institution, proving doubly attractive owing to the fact that withdrawals could be made at any time with accrued interest to date of withdrawal. In a very short time the Bank was thus enabled to absorb large blocks of our Tax Levy Certificates of Indebtedness, as well as long-term bonds, in addition providing a surplus to invest in outside bonds.

During the winter of 1915-1916 a question affecting the legality of this operation arose, receiving considerable impetus by reason of the opposition to the Bank on the part of prominent financial authorities, and the wide publicity accorded the subject by the newspapers. This resulted in what was popularly termed a "hand-made" run. The promptness with which all demands were met, however, restored the confidence of remaining certificate holders, and the run ceased. This was followed by a lull, during which period deposits about offset withdrawals.

In the meantime the following amendment to legalize this feature was prepared, submitted to the vote of the qualified electors and approved by a substantial majority at the general election, held May 2, 1916:

"That Section 223 of said charter be amended so as to read as follows:

"Section 223. Members of the Sinking Fund Committee shall make all purchases and sales for the Sinking Fund with a view to serving the best interests of the city. Funds in Sinking Fund applicable to the purpose shall be used for the purpose of paying maturing bonds, and all bonds so paid shall forthwith be cancelled and filed.

"Bonds of the city of St. Paul and interest-bearing certificates of the city of St. Paul, held by the Sinking Fund Committee, may be sold in fractional parts in multiples of ten dollars. Such sales may be evidenced by certificates of ownership in such form as the Sinking Fund Committee may determine, and the Sinking Fund Committee may sell, repurchase and resell such fractional parts of bonds and interest-bearing certificates in such manner as it may deem to best serve the interest of the city. Bonds and interest-bearing certificates of indebtedness of the city of St. Paul, which may be sold in whole or in part in fractional parts, shall be kept separate from all other securities held by the Sinking Fund Committee; and a complete and detailed schedule of such securities shall be kept by the Commissioner of Finance and a duplicate filed with the Comptroller.

"The certificates of fractional ownership may bear a uniform rate of interest, to be determined by the Sinking Fund Committee, and the schedule above described shall show the proportion owned by the Sinking Fund. All profits arising out of fractional purchases and sales shall be credited to a special fund, and all expenses incurred in such operations shall be charged to said fund. All receipts and dis-

bursements shall be reported daily to the Comptroller."

Suitable regulations governing the conduct of this bank were at once adopted, providing for a businesslike administration thoroly safeguarding the interests of depositors, now numbering approximately 3,500. The institution has done a flourishing business since, and to all appearances enjoys the full confidence of the community. While it is not intended as a profit-making venture, a financial statement as of November 30, 1917, reveals a surplus of $13,770.24. The assets on this date total $2,668,103.90, of which $140,030.71 is cash in banks and $2,478,681.11 in securities at par, and the balance in interest receivable and miscellaneous income. The liabilities amount to $2,610,820 in certificates outstanding and $43,513.66 interest accrued on certificates outstanding. The total expenses in connection with this Bank, which is located in the department of the Commissioner of Finance, do not exceed $2,500 per annum, which is principally for clerical help.

The Bank has been of inestimable value since its inception. Thru its agency we have disposed of our paper, which otherwise would have remained inactive and consequently seriously affecting city activities, owing to statute and charter restrictions limiting the rate of interest as well as prohibiting the sale of bonds and certificates for less than par.

JESSE FOOT,
Comptroller.

HIGHWAY DEPARTMENTS

Road Maintenance a Prime Asset

Concord, Mass.—The work of the Road Commissioners of Concord has been very satisfactory, in spite of the reduced shipments of stone due to a freight embargo and to labor troubles at the stone crusher. We have excelled many cities in effective planning ahead for our work, and it is this feature which constitutes our forward step.

When road work and maintenance was practically at a standstill, we worked our stone crusher to the limit and thereby managed to store up a considerable quantity of road metal for the spring and summer

TYPE OF TRAFFIC SIGNS USED IN CONCORD, MASS.

work. Later we organized a maintenance gang of three men for work in patching the worn spots on the roads. This practically amounts to patrol maintenance, for these men were continually on the road thruout the summer. Their equipment consisted of a two-horse cart and trailer holding about two barrels of oil. They have watched out for all small holes in the bituminous macadam roads, and when these have been cared for they spend the remainder of their time in cleaning out surface drains and catch-basins. This work has been of great value to the city and is worthy of emulation by any municipality. The American practice of building a good road and then letting it go to pieces is no standard for any particular town to adopt. Road maintenance is being more and more appreciated thruout the country every year, and it is to be hoped that the policy of neglect referred to will soon be a thing of the past.

In order to determine the roads which were subject to the heaviest and most severe traffic in Concord, a traffic census was instituted from August 28 to September 3, be-

tween the hours of 7 A. M. and 9 P. M. The count varied from 127 vehicles on Cottage Street to 11,277 vehicles on Main Street for the week. Commencing in the middle of October, some rather startling figures were gathered relating to the traffic per day on the main thorofare thru this town of 7,000 people: on Sunday, September 17, between 3 and 5 P. M., 1,016 vehicles passed the junction of Lexington Road and Cambridge Turnpike; on September 24, for the same hours, 1,909; on October 1 it was 3,200, and on October 8 the count reached the maximum of 3,455 for the same hours.

In our work to improve the appearance of the town for the thousands of visitors who come here every month of the year, twelve new benches were placed near the statue of the Minute-Man and new shrubs were planted around the monument.

The sprinkling on the macadam roads has been confined to one application of Tarvia "B." Last year the tar was shipped in auto trucks and sprayed on the roads by the manufacturers, instead of being shipped in tank cars, to be unloaded and applied by the department's horse-drawn distributor. The method used was very satisfactory from the standpoint of application, for with the pump on the motor truck it was possible to get a more uniform and heavy distribution of the tar.

JOHN M. KEYES,
Chairman, Dept. of Roads and Bridges.

The Unemployment Problem After the War

Municipalities Will Be in a Position to Render Important Assistance

THE following material is extracted from a statement of the British Labor Movement adopted at a special National Labor Conference at Westminster, December 28, 1917:

"Moreover, it cannot but be anticipated that in all countries the dislocation of industry attendant on peace, the instant discharge of millions of munition workers and workers in war trades, and the demobilization of soldiers—in face of the scarcity of industrial capital, the shortage of raw materials, and the insecurity of commercial enterprise—will, unless prompt and energetic action be taken by the several governments, plunge a large part of the wage-earning population into all the miseries of unemployment more or less prolonged. In view of the fact that widespread unemployment in any country, like a famine, is an injury not to that country alone, but impoverishes also the rest of the world, the British Labor Movement holds that it is the duty of every government to take immediate action, not merely to relieve the unemployed when unemployment has set in, but actually, so far as may be practicable, to prevent the occurrence of unemployment.

"It therefore urges upon the labor parties of every country the necessity of their pressing upon their governments the preparation of plans for the execution of all the innumerable public works (such as the making and repairing of roads and railways, the erection of schools and public buildings, the provision of working-class dwellings, and the reclamation and afforestation of land) that will be required in the near future, not for the sake of finding measures of relief for the unemployed, but with a view to those works being undertaken at such a rate in each locality as will suffice, together with the various capitalist enterprises that may be in progress, to maintain at a fairly uniform level year by year, and thruout each year, the aggregate demand for labor, and thus prevent there being any unemployed. It is now known that in this way it is quite possible for any government to prevent, if it chooses, the very occurrence of any widespread or prolonged involuntary unemployment, which, if it is now in any country allowed to occur, is as much the result of government neglect as is any epidemic disease."

Civic Work of Educational Institutions

The National Crisis Demands a New Kind of Public School Teaching

A MILLION or more school boys and girls of all grades thruout the United States are now studying the series of lessons on "Community and National Life" which were announced last summer in the following letter from President Wilson to the schools:

THE WHITE HOUSE
WASHINGTON
August 23, 1917.

To School Officers:

The war is bringing to the minds of our people a new appreciation of the problems of national life and a deeper understanding of the meaning and aims of democracy. Matters which heretofore have seemed commonplace and trivial are seen in a truer light. The urgent demand for the production and proper distribution of food and other national resources has made us aware of the close dependence of individual on individual and nation on nation. The effort to keep up social and industrial organizations in spite of the withdrawal of men for the army has revealed the extent to which modern life has become complex and specialized.

These and other lessons of the war must be learned quickly if we are intelligently and successfully to defend our institutions. When the war is over we must apply the wisdom which we have acquired in purging and ennobling the life of the world.

In these vital tasks of acquiring a broader view of human possibilities the common school must have a large part. I urge that teachers and other school officers increase materially the time and attention devoted to instruction bearing directly on the problems of community and national life.

Such a plea is in no way foreign to the spirit of American public education or of existing practices. Nor is it a plea for a temporary enlargement of the school program appropriate merely to the period of the war. It is a plea for a realization in public education of the new emphasis which the war has given to the ideals of democracy and to the broader conceptions of national life.

In order that there may be definite material at hand with which the schools may at once expand their teaching, I have asked Mr. Hoover and Commissioner Claxton to organize the proper agencies for the preparation and distribution of suitable lessons for the elementary grades and for the high school classes. Lessons thus suggested will serve the double purpose of illustrating in a concrete way what can be undertaken in the schools and of stimulating teachers in all parts of the country to formulate new and appropriate materials drawn directly from the communities in which they live.

Sincerely yours,
WOODROW WILSON.

The idea of teaching the principles of conservation underlying successful prosecution of the war originated with the Food Administration. A letter from Mr. Hoover to school superintendents and principals was sent out soon after the President's letter was written.

The idea was taken over by the Bureau of Education and was laid before state, county and city superintendents by the U. S. Commissioner of Education:

DEPARTMENT OF THE INTERIOR
BUREAU OF EDUCATION, WASHINGTON
September 6, 1917.

To All State, County and City Superintendents:

The movement now under way in many of the schools of the country to provide courses dealing with the problems of community life has been greatly stimulated by the war. The plan suggested in the enclosed letter by the President has been in some measure anticipated by an urgent demand on the part of teachers for suitable material to introduce at this time into their classroom work. The Bureau of Education, coöperating with the United States Food Administration, has secured the services of a number of experienced teachers and writers, and will furnish a body of material which it is hoped will supplement effectively the books and courses now at hand. A full description of the form in which the "Lessons in Community and National Life" will appear and be distributed accompanies this letter.

The purpose and form of these lessons are,

as pointed out in President Wilson's letter, adapted not only to conditions which must obtain while the war continues, but as well to the conditions which will no doubt continue long after the war has ended; which indeed may not pass away for many decades, if ever.

Much of the material to which attention should be given in such courses is to be found in the environment of the school. The lessons provided will be most successful if they lead teachers and pupils to study the communities in which they live.

All school officers are urged to join in this plan, and by the use of the lessons, and by encouraging the study of community problems near at hand, to aid in developing general instruction in the schools of the United States in the privileges and duties of life under our modern social organization.

Yours sincerely,
P. P. Claxton,
Commissioner.

In a valuable article on "Education and National Spirit," in *The Nation* for December 13, Prof. Charles H. Judd gives some of the reasons that justify the publication of these lessons—which might have carried the somewhat more technical title of "The Structure of Society." He says:

"They consist in brief descriptions of typical social and industrial institutions. They are written in concrete terms, which will give the pupils definite mental pictures of what is meant by such terms as community and nation.

"For example, in one of the first series of lessons pupils in the intermediate grades are introduced to the evolution of a city water system. Could a child who has seen such a system grow be in any doubt about the meaning of the word 'community'? Could the word 'society' ever mean to such a child merely a church social or a dance? Another of the early lessons is on a city produce market. There is one on a cotton mill; one which depicts the various manufacturing activities of a self-sufficing colonial home.

"The wonder about these lessons is that school books are not full of them. The fact is that American teachers have never realized that pupils need to be taught about the world in which they live. The school of earlier days did not teach about the life of the home or the life of the community, because these were supposed to be known to pupils from their contact with them. Year after year the situation has grown complex, and pupils have lost contact with all industrial operations and with the complex social organization in which we have all come to be insignificant atoms. The social organization has outgrown the school. The course of study contents itself with the meager lessons appropriate to a simpler and earlier day. In the meantime life has moved to a higher level, which requires a new mode of insight and a breadth of instruction wholly uncalled for in times past.

"The national crisis brings with it a shock of realization. We see that we are as a nation ignorant of the scope and depth of our national life. We would not have it here as it is in Germany. We are right in saying that we will not limit our pupils to the geography of the United States though riotous anarchy results. We are sure that it is necessary for the human spirit to be broad. But if the ways of Germany are utterly abhorrent, may we not take counsel with France? There nationalism has been cultivated by a course in civic morality. Again, even in accepting this example we may contribute breadth. The study of all industry, the study of how men are housed and how public health is promoted, are no less teachings in morality than are the French maxims on honesty and loyalty.

"The 'Lessons in Community and National Life' do not make the mistake which has shipwrecked many an educational reform. They do not limit themselves to urgent exhortations to teachers and school boards to do 'something' and then leave it to the new converts to carry out the hard labor of putting detail into the exhortations. The reformers of the past have often assumed that assent to a general principle is enough to produce a new course of study. Not so. The teachers of this country are, as a class, inexperienced in the broad national issues. They do not know industry and social organization even in theory. To ask them to make lessons in national life would be to demand bricks without supplying either straw or clay.

"This is no time for mere exhortation. The lessons must be supplied in form to be put into the hands of pupils. This has been done. The lessons are reading lessons ready to be taken up by the pupils the moment they arrive from Washington. The question has ben raised: Why does the Food Administration concern itself with such a project? To the mind that sees the present national situation in a broad way the explanation is easy. Any sacrifice which the people of this country make to-day must be the ready contribution of a democratic people, not the blind offering of a people schooled in obedience to a dictator. We have to work out a new type of instruction in nationalism. This new instruction must go into the schools, but it must express itself at once in practical ways. The habits of life and thought of the nation must respond at once to an intellectual apprehension of what the nation is and will become. Our nationalism must be intelligent and practical at once. There is no agency more concerned in this double program than that agency which is making appeal after appeal to our people for loyal national action in conserving food. The joint action of the Food Administration and the Bureau of Education is a hopeful sign of a new type of nationalism in the schools."

The lessons consist of reading material in form to be put directly into the hands of pupils. The text in each case deals with selected topics and is followed by questions and suggestions as to topics which may be

studied, in addition to those presented in the text. Each lesson is accompanied by references to supplementary reading matter related to the text.

There are three grades of lessons, namely: Section A, for the upper classes of the high school; Section B, for the upper grades of the elementary school and the first class of the high school; and Section C, for the intermediate grades of the elementary school. One number, or leaflet, of each section appears each month and contains four lessons filling 32 printed pages. The series began in October and will run thru May, making twenty-four leaflets.

The lessons are edited by Charles H. Judd, Director of the School of Education of the University of Chicago, and Leon H. Marshal, Dean of the School of Commerce and Administration of the University of Chicago.

The following suggestions are offered with regard to the introduction of these lessons into the program: They may properly be introduced as part of the work in reading classes and as subject matter for discussion in English classes. In this connection it may be noted that the subjects taken up are commonly suitable for compositions. Second, the close correlation of the material with geography and history justifies the use in the grades of at least one hour a week drawn from the allotment made to those subjects. Third, where a course in civics or a course in current topics is now given in the school, the lessons will be available as part of the regular work. Fourth, it is suggested that an independent place on the program for a course of this type is amply justified even in the crowded curriculum now given.

The lessons published in October first draw the contrast between the simple life of the pioneer and the colonial family on the one hand and the complex life of a modern community on the other. In this series special attention is given to the effects of the war on industry in this country and abroad.

The lessons published in November deal with production and wise consumption. Various examples are given of natural resources and their use. The principles of conservation are illustrated and made concrete by means of numerous examples.

The lessons of December show the transformations of life which have resulted from the development of machinery. The invention of power engines and power machinery brought an industrial and social revolution. The meaning of these changes for modern life is made clear by means of specific examples.

The January lessons show how the National Government thru its executive departments comes into intimate contact with the production and use of the commodities which make community life possible. Special attention is given to the activities related to war preparation and readjustments in this country necessary for the prosecution of the war.

The February lessons carry the discussion of government into the sphere of state, municipal, and institutional life.

Subsequent numbers will deal with the problems of the financial and personal organization of industry, the results of concentration of population, and the problems of the wage system. Social, civic, and industrial problems and some of their solutions will thus be sketched.

Each lesson presents one or more concrete cases illustrating some important phase of community life. The questions aim to lead teachers and pupils beyond the text into the investigation of problems which arise in the immediate environment of the school. It is hoped that methods of productive teaching will be promoted by the use of the questions quite as much as by the study of the matter in the text.

Editorial Note.—It is not possible for the Bureau of Education to supply gratuitously the number of leaflets for which there is demand. Arrangements have been made, however, by which they may be furnished at the actual cost of printing and handling. The prices are as follows: one copy of any 32-page leaflet, 5 cents; two or more copies, 3 cents each; 100 copies, $2; 500 copies, $5; 1,000 copies, $9.50; subscriptions for the series of eight leaflets in any section, eight times the prices named.

The three sections are considered as separate publications in determining prices, but combinations may be made under certain conditions. If practicable, requirements should be stated and prices asked before an order is written.

All correspondence should be addressed to the Commissioner of Education, Washington, D. C. Money should be sent as cash in a registered letter, or by certified check or post office money order, made payable to the "Superintendent of Public Documents." Stamps are not accepted.

Under this heading there will be published during 1918 *in* THE AMERICAN CITY *a series of articles on Central and South American municipalities, thru the courtesy of the Pan-American Union. The Pan-American Union is the international organization, with headquarters at Washington, D. C., maintained by the twenty-one American republics for the development of good understanding, friendly intercourse, commerce and peace among them. The third and fourth articles of this series will deal with municipal conditions in Rio de Janeiro and Santiago, Chile.*

Montevideo: The City of Roses

MON-TAY-VEE-DAY'-O is about the way the Uruguayans pronounce the name of their capital; not Mon-te-vid'-e-o, as many well-informed persons in the United States persist in pronouncing it.

Altho the city of Montevideo was permanently founded by the Spaniards, the Portuguese were directly responsible for the selection of the site. Montevideo's history is practically Uruguay's history. For many years the country was the bone of contention between the Spaniards and the Portuguese, until finally it achieved its independence from Spain. For a time that independence was threatened by its two powerful neighbors, Argentina and Brazil, but in 1828 both of those countries by formal treaty recognized Uruguay as a free and independent republic.

The City's Progress and Its People

For a century and a half after its founding Montevideo grew steadily but slowly. In 1879 it had not more than 70,000 inhabitants. Then came an awakening which resulted in remarkable progress. From an old-fashioned, untidy, overgrown town it has evolved into a modern, clean, sanitary and well-governed cosmopolitan city of 400,000 people. In its care for the blind, poor and defective; in its provision for the safeguarding of the health of its citizens; in its systems of education; in the conservative control of its finances—in short, in the exercise of all of its civic functions—it is a progressive and well-managed city.

No adjective more aptly describes the population, as well as the city, than the word "sturdy." As soon as one lands in Montevideo, one is impressed with the sturdiness, the self-reliance, the confident independence of the people he meets. They do not "put on airs." There is no effort at gaudy display of any kind. They are earnest, they are honest and they are competent —and they know it. They are thoro, and they build from the ground up in everything, whether it is a material structure of steel and stone or an ideal structure of finance and credit. That is what makes the Uruguayan peso worth $1.04 in United States gold; that is what has made Uruguayan bonds in demand in the money centers of the world.

The city's streets are wide, well-paved and well-lighted, and are able to accommodate the traffic. Its public buildings are artistic, roomy and well adapted to the uses for which they were intended. Take the Solis Theater, for instance. It is one of the finest and largest in South America, but it was not built merely for display. It was built because the Montevideans love good music, and the greatest of European stars in

grand opera are brought over to sing for them. Every great singer who is induced to fill an engagement in Buenos Aires is certain also to appear in Montevideo, and there are so many well-to-do people in the city who are willing to pay even extravagant prices for admission that it takes a very large building to accommodate them. Hence the size of the Solis.

The Parks and Gardens

The Uruguayan is the product of the free and open life of his great, rolling plains, and when he settles down to city life he must needs have light and air and space to move about in. So Montevideo is supplied with good, wide streets, about three hundred of them, and along their sides are planted rows of fine shade trees. At intervals there are large open squares, laid out in gardens filled with exquisite flowers. An ardent love of the beautiful in nature is a characteristic of the people, and in nothing does it find greater expression than in their passion for flowers. The parks, public squares and private gardens are filled with them, and Montevideo is often called "The City of Roses." Every traveler who visits Montevideo is struck with the beauty and variety of its floral display. The Rev. Dr. J. A. Zahm, in his "Through South America's Southland," says:

"But the gardens! And the flowers! Never have I seen in any part of the world such marvelous exhibitions of flowering plants and shrubs, native and exotic, as are found about the homes and quintas of the Montevideans. With backgrounds of palm, orange, myrtle, magnolia, bamboo, mimosa, alternating with the native paraiso and ombú trees and the Australian eucalyptus, one finds beds of pansies, carnations, marguerites and lilies, together with hedges of lilac and guelderrose and cineraria, while walls and houses are covered with multi-colored draperies of wistaria, honeysuckle, Bougainvillea and numerous other creepers of every form and hue.

A GARDEN OF ROSES IN THE PRADO, MONTEVIDEO

"It is, however, in their roses that the Montevideans take their greatest pride. They are found everywhere, in private gardens and in public parks, in clumps and hedges, trained to trellises and columns, or falling in showers over walls and railings. But nowhere are they seen to such advantage as in the Parque Urbano and in the Paseo del Prado—those exquisite pleasure grounds of the national capital. Here there are no less than 800 varieties of roses collected from every clime. The rose bushes themselves number many thousands."

One of the principal conditions which affect this floral profusion and make it pos-

sible is the wonderful climate of the country. The mean temperature of Montevideo's winter is about 52° F.; of its spring, 64° F.; its summer, 71° F.; and its autumn, 61° F. The average of fair, sunshiny days is about 225 per year.

The Beaches

Largely because of this salubrious climate, and also because of the naturally fine facilities for sea bathing, Montevideo has become the most popular summer resort in South America. Of the fine bathing beaches, Pocitos is perhaps the most fashionable and exclusive. It is located about three miles from the center of the city and can be reached in twenty minutes by two different lines of street railways. Along the streets leading to it and at the resort itself are to be found hundreds of picturesque villas and artistic summer homes set in gardens of gorgeous flowers and green shrubbery, occupied by wealthy families from various sections of the country, from Buenos Aires, and even from the southern portions of Brazil. Running along back of the beach is a raised, well-paved esplanade, which extends about three-fourths of the way around the bay and corresponds to the celebrated "Board Walk" of Atlantic City, N. J.

The Playa Ramirez is about a mile closer to the heart of the city than is Pocitos, and is perhaps the most popular and democratic of all of Montevideo's resorts. Besides the exceptionally fine beach and its bathing facilities, Ramirez has as a background for its setting the picturesque and well-kept Parque Urbano. Here are groves of fine trees, gardens filled with exquisite flowers and shrubs, and an artificial lake large enough to accommodate a number of motor boats, gondolas, canoes, etc. The beach and park together offer a splendid playground for adults as well as children, and the management of the resort provides many forms of healthy and innocent amusements for its patrons.

The Administration of the City Departments

Montevideo's remarkable progress in recent years has been largely due to the intelligent and efficient manner in which its municipal government has been conducted. At its head is the intendente, or mayor, who is appointed by the National Government, while the members of the municipal council, the legislative body, are elected by the qualified voters of the municipality, which is divided into districts or wards. The work of the municipal government is divided among a number of departments and is conducted much like that of the larger cities of the United States.

Especially efficient is the department of public health, which is provided with many modern facilities and devices to prevent the spread of disease and to care for the sanitary welfare of the citizens. The city has numerous well-equipped hospitals, some devoted to contagious and infectious diseases that might become epidemic, others for ordinary diseases, while special sanitariums are provided for consumptives and a special hospital for syphilitics.

The location of the city is such that its drainage facilities are unusually good. The peninsula on which it is built is shaped something like the back of a whale and is almost a solid bank of gneiss overlaid with a comparatively thin stratum of soil. The city's center is about 40 feet above sea level, and the ground slopes gradually on both sides, so there is a natural drainage that materially aids the artificial system. With its ideal climate and splendid location supplemented with modern comforts and conveniences, Montevideo has become a nearly ideal health resort.

As an instance showing the care and forethought of the Uruguayan Government in preserving the openness and attractive features of the streets of its cities and the roadways of the country, may be cited the law which went into effect in 1916 providing that all buildings on public streets outside of the radius of the city of Montevideo and other urban centers of Uruguay must be constructed at least 32.8 feet from the boundary line of the property. Within the city limits the free space must be at least 13.12 feet. These distances, respectively, are to be measured from the front boundary line of the land to the most salient part of the building, and the space between must not be occupied by steps, balustrade or ornaments. The law also makes obligatory the construction of fences on property in Montevideo, even if lots are vacant, when pavement has been laid. The fences must be of artistic iron grating, wood or other suitable material and they

must be of the height required by previous regulations.

Montevideo believes in having plenty of light. It was one of the first of South American cities to install an adequate electric light plant. The streets are always well-lighted, but to see them at their best one must be there during the carnival season, when the main thorofares and all public buildings are ablaze with thousands of multicolored electric lights. As an instance may be cited the carnival held in February, 1914. During this week of festivity there were 139,703 extra incandescent globes and arc lights used in this manner. The illuminated area began at one of the public squares on the main avenue of the city, where there was a large mechanical set piece of a moving chariot from which fell showers of gold poured from a horn of plenty. This figure was 50 feet high by 40 wide, and contained about 12,000 lights. The main street was decorated for fifteen blocks with festoons of lights of different colors reaching from side to side. There were eight festoons to each block, using a total of about 28,000 lights. In the main plaza there were about 30,000 lights arranged in fancy scroll pattern, and in the Cathedral Plaza 60 arc lights and 25,000 incandescents were massed in pyramids 40 feet from the ground. One portion of the main street, extending for two blocks, had 14 varicolored butterflies reaching from side to side and using 5,000 lights. All of the theaters and public buildings were decorated, most of them being wired on the outside so that the lines of the structures were traced in glittering points of light. The beach at Pocitos had tall pyramids of colored lights in which about 16,000 incandescents were used.

The Industries

Uruguay is primarily a cattle and sheep country, and secondly an agricultural garden spot of the world. As a result, its manufacturing enterprises are almost altogether related to one or the other of these industries, animal products in various forms taking the lead of all others.

Over a hundred and sixty years ago some one happily stumbled on the idea that thousands of pounds of fresh beef usually wasted or fed to dogs could be preserved to the use of man in other sections of the world not so well provided with cattle, and a "saladero" (a meat drying and salting establishment) opened the way for an enormous industry. The jerked beef which enters into the daily rations of many thousands of families in Brazil, Cuba and various other tropical countries, and furnishes the meat supply for many of the troops now engaged on the battle fields of Europe, comes chiefly from these great "saladeros" of Uruguay, thirteen or fourteen of which are located in the department of Montevideo. One of the interesting sights of the city is to be found in some of these establishments, where one may see acres upon acres of posts connected with wire upon which is hung the meat that is dried by the sun. This meat, besides being dried, is thoroly salted, and will keep for a long time under conditions which would spoil it if preserved in any other manner. Three large modern packing houses, called "frigorificos" in the Spanish-speaking countries, are located in Montevideo.

Other industries growing out of the cattle business are dairies, creameries and tanneries. The spinning and weaving industry is represented in Montevideo by several large woolen mills, well-equipped and prosperous. Among other manufacturing plants may be mentioned a rice mill, factories for leather, canning, chocolate and candy, matches, butter and cheese, boots and shoes, tobacco, soap and furniture; also brass and iron foundries, sawmills, and one of the largest cement plants in South America.

The Educational System

Preëminent among Uruguay's efficient institutions is its fine educational system. According to the statistics of 1911 there were 1,011 primary public schools in the country. Primary and graded schools together numbered 1,310, the number of pupils attending being 137,000. The population at that time was 1,094,688, so that there was one public school for every 843 inhabitants. Many new schools have been added to the number since this census was taken but exact figures are not available.

As to higher education, what may be termed the capstone of the entire educational structure of the country is the celebrated University of Montevideo, founded in 1849. This institution has a number of departments, each under a special faculty

AVENIDA 18 DE JULIO, MONTEVIDEO

Among these are, in addition to the strictly scientific and literary course which leads to the degree of bachelor of science and letters, the departments of law and sociology, medicine, pharmacy, mathematics, commerce, veterinary science and agronomy. Each of these departments is provided with special facilities, such as libraries, museums, laboratories, etc.

It is, perhaps, largely due to the advanced educational methods of the republic that the government of Uruguay has for the last fifteen or twenty years been among the most progressive in the world. Uruguay does not wait for some other country to try out a new idea in government; it tries the experiment itself, and if the innovation proves to be good it is retained. Among the legislative measures which have been adopted in the last two years are the following: a law providing for government control of the telegraph, telephone and postal services; a law providing an eight-hour day for workingmen; a workmen's compensation law; the taxation of advertising, and a rigid bank-inspection law.

A City Managers' Year-Book

To the Editor of The American City:

Plans for the publishing of a City Managers' Year-book by the City Managers' Association are well under way. This year-book will replace the annual convention proceedings heretofore published. It will contain the proceedings of the fourth annual convention of the Association, held in Detroit last November, but in addition will contain "achievement reports" from all over the country and will be illustrated by charts and portraits of city managers.

The chief object in broadening out is to give fair representation to those city managers so situated as to be unable to attend the annual conventions, and to furnish the public with concrete information from a far greater number of city-manager cities than was possible under the old plan.

Information as to new cities adopting the manager plan and changes in the personnel of the managers, will be very welcome. Mailing lists are being revised and communications should be addressed to the Secretary of the Association. A nominal charge of 25 cents per copy, as heretofore, will be made to cover cost of publication.

Beaufort, S. C. H. G. Otis,

Secretary-Treasurer, City Managers' Association.

War Gardens as City Assets

Home Vegetable Plots Add to the Wealth and Attractiveness of the Community

By Charles Lathrop Pack
President, National War Garden Commission

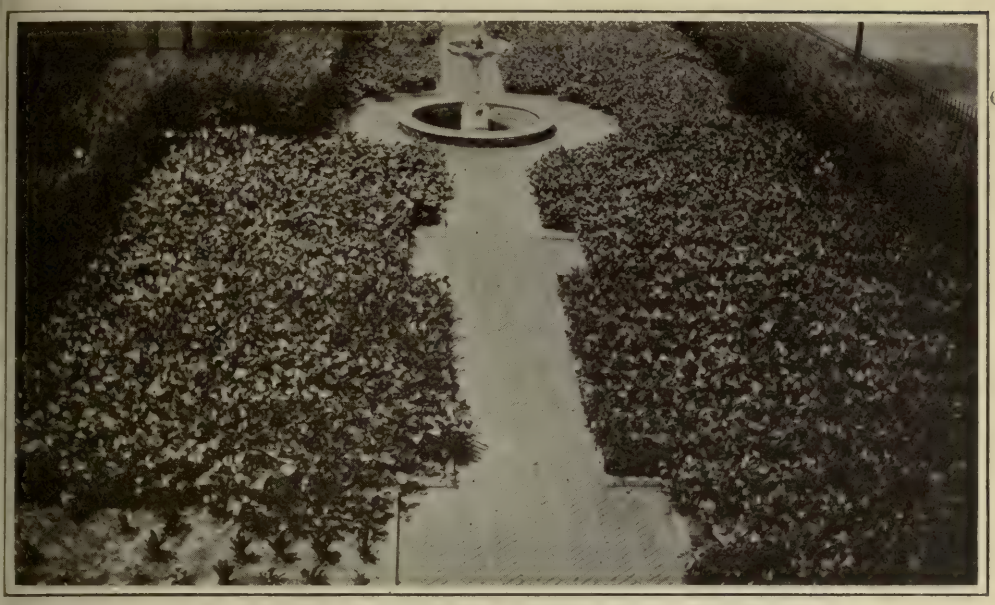
IT is far more true than most of us realize that the city beautiful is also likely to be the city prosperous, the city progressive, the city commercially worth while. To every city in the country there is now offered the opportunity to combine a business asset and a beautification scheme with patriotic service. This opportunity, which now in reality becomes a duty, is found in "war gardens." The cultivating of home gardens by hundreds and thousands in every city thruout the United States will constitute a source of wealth to the community which will mean an appreciable increase in its total resources. At the same time, multitudes of back yards and vacant lots which have been either plain and unadorned or veritable eyesores to the neighborhood, with weeds and rank grass, will be transformed into spots of growing, green beauty. In the third place, there will be an important addition to the vitally needed food supplies of the nation.

Increasing the Food Supplies

Let us take these up in reverse order, for no one will deny that, in spite of the benefits which may accrue to the individual city from war gardening, the needs of the nation are of paramount consideration. It is just as much of a crime against humanity for "slacker land" to exist in the United States as for army slackers to escape thru lack of detection from giving their services to their country. As nearly as possible, every available foot of land should be put

A PRIZE-WINNING WINDOW DISPLAY BY A SALT LAKE CITY FIRM, WHICH SHOWS THE NEED OF THE CONSERVATION MESSAGE CARRIED BY THE NATIONAL WAR GARDEN COMMISSION

It is urged that such displays be made by all real estate dealers, in a nation-wide campaign to buy and plant land



WAR GARDEN AT A PRIVATE RESIDENCE IN NEW HAVEN
The attractiveness of the scene is not lessened by the realization that the vegetables have taken the place of a beautiful lawn and flowers

to work for democracy. The farmers, of course, are doing their share; but on account of the shortage of labor they will not find it possible to till all the soil which should be producing crops. So it becomes the duty of every city and town to help feed itself and at the same time feed the soldiers and the people of the entire nation and of our allies.

The help which can be given toward solving the essential food production problem thru home gardens cultivated by city "soldiers of the soil" is tremendous. The aggregate of food which can be raised on a million or five million tiny home garden plots will have a wonderful effect on the final result. Last year, thru the encouragement given to the movement by the National War Garden Commission and other organizations, something like 3,000,000 war gardens were planted, ranging in size from little patches of ground 20 by 30 feet to those covering an acre or more. The value of the product grown, as estimated from reports to the Commission, amounted to more than $300,000,000. This was surely worth while; and every small amateur gardener can feel that he had his share in the great work. As a result of the food production campaign and the conservation drive which followed it, more than 450,000,000 jars of preserved vegetables and fruits were stowed away on home shelves for winter use. This year it is the hope of the Commission that the number of gardens will be doubled at least, and that the value of the product will round out a billion dollars. If this can be done—and it should be done—there will be little doubt about the ability of the United States to provide itself and its allies with sufficient food. From its Washington headquarters last year the Commission distributed more than 2,000,000 of its garden primers giving all the information needed by anyone who desired to shoulder a hoe and get out into the trenches of the back yard.

War Gardens as City Beautifiers

In these days it does not take much stretch of the imagination to see beauty in a bed of crisp, green lettuce or in a row of onion tops and beets, which rivals even the charm of a garden of rare flowers. To-day a back yard filled with ripening beans and tomato vines is handsomer than one filled with roses. The ordinary back yard, as a rule, is bare of flowers, these being reserved for the show place in front of the house, and so a vegetable garden in the space at the rear is highly to be commended as an

attraction to the place. Anyone renting or buying a place which could display a healthy and prosperous-looking garden would probably be put into a happy frame of mind by the sight of this growing food and be willing to pay more than otherwise.

As to the vacant lots which straggle and scramble all along many city streets, with unsightly briars and weeds forming the background for ashes, tin cans and dirty papers, it requires nothing more than the mere statement of fact to convince anyone that the sooner these "sore spots" are supplanted by something better and more useful, the more advantageous in many ways will it be for the entire neighborhood and community. It is hard to realize sometimes, until an actual enumeration is made of such vacant spaces, how many acres of land they contain. There is scarcely a city of any size in the country which is not thus burdened with a total of hundreds of acres of idle, useless land. With little effort these piles of rubbish and breeders of disease can be turned into rich gardens which will bring forth abundant harvests of food to help feed the city and the nation. The Commission on Beautifying the City of Norfolk, Va., where there were between 1,200 and 1,500 vacant lot gardens last year, announces that it is preparing to quadruple the work this year, thus helping to add to the attractiveness of the city, as well as increasing the food supply. Last year the vacant lot gardens of Norfolk produced about $70,000 worth of vegetables and other foodstuffs.

Certain sections of the country and certain cities have delighted in the title which has been applied to them of "Garden State," "Garden County" or "Garden City." It should be the aim of every city and town in the United States to deserve this honorable title. The more it can be bestowed upon, the better pleased should be each place which receives it. For its value will grow, not in proportion to the rarity, but according to the number of times it is granted. "This city has fed itself" is a slogan which should be back of every garden campaign in every city and town in the United States.

Local Material Benefits

In many other ways will the city which is filled from end to end with war gardens be benefited. Aside from the national and spiritual blessings which come from patriotic duty well performed, and in addition to the enjoyment and content which the citizens will feel in a beautified community, there will be numerous material advantages. Denver figured that it raised more than $2,000,000 worth of vegetables and other food products in its war gardens last year. This is a sum of money which is worth keeping at home. The state of West Virginia, it was estimated, has sent $7,000,000 out of its borders annually for food. Altho it is not naturally an agricultural region, J. W. Stewart, State Commissioner of Agriculture, decided that a considerable portion of this large sum could be kept in the state; and so, long before last winter's snow was off the ground, he set about organizing the Patriotic Garden League. Thru systematic canvass and education of the people in every community of West Virginia it was believed that many thousands of city, town and village dwellers could be shown the value and the importance of home gardening, both as a benefit to themselves and the state.

Business men everywhere can throw trade their own way by encouraging their fellow-townsmen to plant gardens. The money which is saved will go into houses and lots, into automobiles, into books, into furniture, into pianos, into clothing, into everything, in fact, that modern man needs for his comfort and happiness. Banks will have larger individual balances if more of their customers' money stays in the city, instead of being scattered far and wide for food which can be grown just as readily and far cheaper at home.

Large industrial concerns will gain from encouraging their employes to start war gardens; in fact, such companies should furnish part of the initiative and part of the funds, if necessary, to get the enterprise started. A number of large manufacturing plants did this successfully last year and have prepared to do so again this year. The representative of one of these companies—Foster, Merriam & Co., of Meriden, Conn.—sums up well the advantages gained when he says: "Besides the material gain, the garden work promoted a fine spirit of democracy and fellowship among the men. The president of the company and each one connected with it down to the humblest em-

TRACTOR PLOWING THE WAR GARDEN OF THE GENERAL ELECTRIC COMPANY AT SCHENECTADY, N. Y.

ploye had a plot, and officers and employes, working together as they did, found mutual interests and fellowship therein." This company, as did many others, bought the seed and fertilizer required to start the gardens, and allowed the men to pay for them on the installment plan.

Much of the social unrest which exists in many industrial communities will be allayed when the workers come to feel that they

A SECTION OF THE WAR GARDENS MAINTAINED BY THE OLIVER CHILLED PLOW COMPANY, AT SOUTH BEND, IND.

Planted according to the instructions in the garden primers sent out by the National War Garden Commission

have some real part in the community life and activity; that their welfare is closely linked up, even if only in a small way, with that of those about them, and that they are of benefit to others at the same time that they are being benefited. Nothing will give this feeling of community interest more quickly and more assuredly than working in the ground together.

As an example of what a city public utility can do to help along the war garden work, and of the benefit which comes to the city as a result, the action of the Denver Union Water Company furnishes a fine illustration. Last year this company offered free water licenses to everybody in the city who would convert lots into gardens. As a result of this generous offer, there were issued 4,621 permits, in addition to 30,122 paid water licenses issued in the regular way. The company established a vegetable garden department, with Prof. P. L. Clarke, of the Berkeley School, in charge, and also engaged a domestic science expert to give demonstrations and lectures on canning. Between 5,000 and 6,000 women attended. Garden exhibits were held under the auspices of the Denver Mothers' Congress and by various schools. It was estimated that about two-thirds of the people who had paid water licenses raised vegetables in their back yards and that there were fully 5,000 dry-land gardens, so that altogether there were 30,000 gardens cultivated thruout the city. The food raised was figured as worth more than $2,000,000. Many acres of vacant city land were still left to weeds.

Enterprising real estate firms have found the home-garden movement an excellent opportunity to encourage the purchase of home and garden tracts by people who were eager to call the land which they were cultivating their own. Numerous business concerns thruout the country made the food production campaign, and the conservation movement which accompanied it, the occasion for attractive window displays, and for calling the attention of passers-by to the value and the importance of helping to increase the food supply of the nation.

Every city that helps itself in this way will have the added satisfaction of knowing that it has taken a vital part in winning the war. "Weight of food" is just as essential as "weight of metal" in crushing the enemy. Let every "war garden" add its bit to that weight.

Editorial Note.—The National War Garden Commission will furnish single copies of "War Vegetable Gardening" free to anyone upon request, and will send this 32-page illustrated book in limited quantities free to any chamber of commerce or other organization which desires to distribute them, or to organize garden clubs. In large quantities it will supply them at cost—$15 per thousand—with the chamber of commerce or business concern's imprint upon them, if desired. In the same way the Commission will furnish, for use in connection with the conservation of garden products, either of the following pamphlets: "Home Canning for Vegetables and Fruits" and "Home Drying for Vegetables and Fruits."

Conserve Ammonia by Using Natural Ice

One of the best opportunities of conserving ammonia is made available by the substitution of natural ice for the manufactured product. This substitution is being provided for thruout the country, and it is expected that a very large percentage of the ice used next summer will be ice that the Food Administration is encouraging people to harvest now from rivers and ponds wherever possible.

A serious obstruction in the way of this splendid opportunity of providing an urgently needed chemical for our army and navy is caused by the fact that several large cities have restrictions against the use of natural ice. It is obvious that municipalities should not permit the use of polluted ice. There is much misapprehension and prejudice concerning the use of natural ice that careful consideration and study will dispel. To any Boards of Health, etc., interested in this subject, the Food Administration will be glad to send any of the following booklets, published by the Natural Ice Association of America, 18 East Forty-first Street, New York City:

Status of Scientific Opinion of the Purity of Natural Ice
The Effect of Handling and Storage on the Safety and Purity of Ice
Non-Relation of Natural Ice to Typhoid Fever and Dysentery
The Purity of Natural Ice
The Bacteriology of Ice
The Sanitary-Chemical and Bacteriological Examination of Natural Ice
Melted Natural Ice Compared with Bottled Spring Water for Drinking
The Study of the Purity of Natural Ice from Polluted Water
Melted Natural Ice vs. Bottled Spring or Distilled Water for Drinking
Bacteria in Natural Ice
Natural Ice and the Public Health
Factors of Sanitary Safety in a Natural Ice Supply
Water from Melted Natural Ice for Domestic Use

An Efficient System of Garbage Collection and Disposal

By Fred Goeringer
Commissioner of Public Safety, Wilkes-Barre, Pa.

THE new garbage collection rules in Wilkes-Barre and the disposal of practically all garbage by feeding to swine under cleanly conditions and surroundings have very nearly solved the garbage disposal problem. The land adjacent to the piggery is so attractive that the public grounds are frequented by picnic parties out for a day of fresh air in the country. Thus have we abolished the old alliance of pigs, garbage and offensive odors.

Our whole system of garbage collection and disposal is maintained at a high standard of cleanliness and effectiveness. Garbage is collected twice each week from every house in the city and daily from the larger establishments. The city requires that householders furnish their own garbage cans or receptacles and that the cans shall be of sufficient size and number to contain all garbage which may accumulate between collections. The cans must be water-tight and maintained in good repair at all times. No container not of metal is permitted, and all must be provided with handles to facilitate removal from the premises for emptying. The size of receptacles is specified as not "having [a] capacity of less than 3 or more than 10 gallons, nor [shall any person have] more than one receptacle containing less than 10 gallons." In this way we prevent the use of a great number of unnecessary containers, which take time to empty and which are likely to be knocked over. Further provision is made by the Department of Public Safety that all garbage shall be thoroly drained of its free moisture before being placed in the receptacle, and all garbage must be placed in proper containers.

In order to facilitate collection and eliminate as nearly as possible all delay, a set of "Rules Pertaining to the Collection of Garbage in the City of Wilkes-Barre, Pa.," from which the following pertinent regulations are quoted, were formulated and distributed to householders:

THE GARBAGE-COLLECTION WAGONS OWNED BY THE CONTRACTOR, WILKES-BARRE, PA.

RECEPTACLES TO BE COVERED AND KEPT IN CONVENIENT PLACE

9. Each person aforesaid [occupants of any dwelling house, apartment or tenement house, proprietors of boarding-houses, commission warehouses, hotels, restaurants and other places where garbage is accumulated] shall cause such receptacles [as described above] to be kept covered at all times, and to be placed and remain, between the hours of 6 A. M. and 6 P. M., of each day, or while the collection is made from his or her premises, in such position as to be easily accessible to the garbage collector. No person shall place or cause to be placed in any garbage receptacle any substance other than garbage [which is adequately defined in the second paragraph of the regulations]. If so placed, the contractor is relieved from making the collection and must report the matter to the Superintendent of Public Safety.

CONDUCT OF EMPLOYES

10. Any employe using improper language, being under the influence of liquor, or demanding payment for service rendered or falsifying any report he may be compelled to make, shall at once be discharged and debarred from further employment on the work.

Do not argue with the collector. Remember that he

has a disagreeable job. Send all complaints to the Superintendent of Public Safety.

CANS TO BE PROVIDED BY RESIDENTS

11. It will be [the] duty of every resident, householder, tenant, hotel-keeper, boarding-house keeper, retail dealer and all other persons occupying dwellings within the city of Wilkes-Barre, under a proper ordinance or ordinances enacted or to be enacted by the City Council, to provide or cause to be provided and at all times keep or cause to be kept, or provided, metallic cans for holding garbage; said receptacles or vessels to be perfectly water-tight and so kept, with a handle or handles on the outside, and provided with a tightly fitting cover, shall not be removed except when absolutely necessary, same to be approved by the Superintendent of Public Safety and the City Council. All vessels or receptacles shall be placed in the rear of the house, outside the back door or in the basements, areas or passageways, and never upon the street, alley, sidewalk or other public place, and shall be of a capacity of not less than three nor more than ten gallons. All such vessels or receptacles shall be accessible to the collector when called for, and no person, except authorized, shall in any manner interfere with said vessels or receptacles, or the contents thereof.

FAILURE OF HOUSEHOLDERS TO HAVE GARBAGE READY

12. The contractor for collection shall be required to furnish to the Superintendent of the Department of Public Safety, immediate notice of the failure of any householder to have garbage ready for collection on the day set for such collection, or the placing by the householder in the garbage receptacle anything but garbage, which the collector is not obliged to collect.

Do not keep your gate locked if you have a dog. Chain him.

Collection of garbage is contracted for annually, the last contract calling for the payment of $18,500 by the city in semi-monthly instalments instead of by the load. The contractor uses closed sheet iron Studebaker wagons and carts for collection. The one-horse carts have a capacity of 1½ cubic yards and the two-horse wagons carry 2 cubic yards. The complete equipment, which includes the motor truck, is shown in one of the accompanying illustrations.

WELL-LIGHTED INTERIOR OF PIGGERY, SHOWING PENS

The horse-drawn carts and wagons are used in the house-to-house collection and deliver the garbage to the central depot, where it is carefully sorted and washed. Refuse separated at this loading station is disposed of by burying unless it has some fertilizing value, in which case it is sold to dealers in fertilizers. All wagons, carts and cans used in collection are washed by a high-pressure stream of water each day.

EXTERIOR OF PIGGERY, WILKES-BARRE, PA., SHOWING FACILITIES FOR VENTILATION

A single Mack motor truck hauls the selected garbage in cans to the contractor's piggery, located in a pine grove about three miles from the city. The truck makes from five to eight trips daily, hauling about 25 tons of garbage. The cans carried on the truck are of 12 gallons capacity and have tight-fitting covers. By using these, the garbage is more readily handled, both at the loading station and the piggery, and less garbage is dropped on the ground to decompose and cause odors.

The farm where the piggery is located contains 132 acres; a part of this land is seeded with corn, which is fed to the pigs for six weeks before they are marketed. The main piggery building measures 32 by 120 feet and will accommodate about 500 pigs. At present there are about 470 on the farm. As may be seen in both interior and exterior views of the piggery, there is ample ventilation. The building is thoroly washed out twice each day and disinfected with a coal tar product mixed with water.

To guard against hog cholera, the pigs are inoculated with serum only, which protects them for a period of from six to eight weeks. The pigs are given all the fresh water they want and are fed once a day both summer and winter. All refuse from the building is buried to prevent nuisance.

The piggery floor is concrete, and at the rear of each pen is a plank platform, which gives the pigs a dry bed. In winter, straw is used for bedding on the planks. The steam boiler, located at one end of the building and used for sterilizing the garbage before it is fed to the hogs, keeps the entire building sufficiently warm in cold weather.

There are sixteen storm buildings, each 16 feet square, constructed as shelters for the pigs during stormy weather.

On the Calendar of Conventions

February 4-7,—St. Louis, Mo.
American Road Builders' Association. Annual convention. The exhibits this year will be confined to a display in the ballroom of the Hotel Statler, in which the sessions will be held. Secretary, E. L. Powers, 150 Nassau Street, New York City.

February 14-15.—Trenton, N. J.
Annual Conference of State and Local Boards of Health in New Jersey. Address, Jacob C. Price, M.D., director New Jersey State Department of Health, Trenton, N. J.

February 15.—Trenton, N. J.
New Jersey Sewage Works Association. Annual meeting. Secretary, Frederick T. Parker, Guarantee Trust Building, Atlantic City, N. J.

February 18-21. Toronto, Ont.
Annual Conference on Road Construction for County and Township Road Superintendents and Engineers in Ontario. Held under the auspices of the Ontario Department of Public Highways. Address W. A. McLean, Deputy Minister, Department of Public Highways, Toronto, Ont.

February 21-23.—Washington, D. C.
National Society for the Promotion of Industrial Education. Annual meeting. Secretary, Alvin E. Dodd, 140 West Forty-second Street, New York City.

February 25-March 2.—Atlantic City, N. J.
Department of Superintendence of the National Education Association of the United States. Secretary, J. W. Crabtree, 1400 Massachusetts Avenue, N. W., Washington, D. C.

April 10-12.—Chicago, Ill.
Chamber of Commerce of the United States of America. Annual meeting. General Secretary, Elliot H. Goodwin, Riggs Building, Washington, D. C.

May 13-17.—St. Louis, Mo.
American Water Works Association. Annual convention. Secretary, J. M. Diven, 47 State Street, Troy, N. Y.

Items of Municipal Law

By A. L. H. Street

Regulating Golf Courses

An ordinance of the village of Forest Park, a suburb of Chicago, purporting to impose an annual license fee of $750 against golf courses conducted within the village limits, has been annulled by the Illinois Supreme Court as involving an excess of the village's legislative powers. (Condon vs. Village of Forest Park, 115 Northeastern Reporter, 825.)

The decision recognizes the full power of the Legislature to control, directly or thru municipalities, matters affecting the public health and comfort, but holds that the game of golf is in itself a harmless recreation which does not call for police supervision or regulation; and that, even if police regulation were fairly required, imposition of a $750 fee would be unreasonably disproportionate to any necessary municipal expense to be incurred in regulating a single golf course. It is further decided that a golf course is not to be regarded as coming within charter authority given the village to license keepers of "exhibitions, shows and amusements."

✣ ✣

Control Over Municipal Corporations

Treating sanitary districts and cities as being mere agencies of the state, with ample power vested in the State Legislature to shift public activities from one class to the other, the Supreme Court of Illinois decided the other day, in the case of Rylands vs. Clark, 115 Northeastern Reporter, 829, that a taxpayer in the Sanitary District of Chicago was not entitled to enjoin the board of trustees of the district from expending funds in erecting bridges across the main channel of the district in the city of Chicago, on the ground of invalidity of an act of the State Legislature providing for subsequent conveyance of the bridges to the city, free of cost. The court said:

"Appellant [the complaining taxpayer] has no vested rights in the property of the Sanitary District or to have such corporation continue in existence. The law is well settled that municipal corporations are purely creatures of the legislative will and subject to its control, and may be created or annulled at the pleasure of the body creating them, and their property turned over to some other municipal corporation, and their powers and duties conferred upon such other body."

Incinerator Plants as Nuisance

Where the occupancy of real estate in a city is rendered less desirable because of offensive odors emitted from an incinerator plant operated near-by by the municipality, the owner of such real estate has a valid claim for damages against the city. If the conditions complained of are of a permanent character, there must be a single and final award of damages based on depreciation in the value of the property of the plaintiff, but if the conditions are of a temporary character only, being produced by some negligent or improper manner in which the plant is operated, there may be successive actions on account of continuing injury to the usable value of the property. (West Virginia Supreme Court of Appeals, Keene vs. City of Huntington, 92 Southeastern Reporter, 119.)

✣ ✣

Steeple Bells as Nuisances

One residing in the neighborhood of a church in which a clock strikes the hours in a loud and harsh manner, interfering with conversation and awaking the slumbering, may restrain continuation of the practice as amounting to a nuisance. But one who moves into a neighborhood near a church, the bell of which has been rung for years to summon people to Sunday services, is not entitled to enjoin ringing for that purpose. (New Jersey Court of Chancery, Terhune vs. Trustees of Methodist Episcopal Church of Matawan, 100 Atlantic Reporter, 342.)

✣ ✣

Validity of Occupation License Tax

The statutes of Virginia having treated general building contractors as a class subject to imposition of a single license tax, it was beyond the power of the city of Norfolk to adopt an ordinance under which they would be required to pay separate taxes on brick masonry work, plastering, roofing and sheet metal work, cement and concrete construction, painting and decorating, and stone work. (Virginia Supreme Court of Appeals, City of Norfolk vs. Griffin Brothers, 9 Southeastern Reporter, 640.)

A Back Yard Contrast

From the accompanying contrasting views of back yards the vast improvement of wire fencing over board fencing is apparent. Aside from the neater and more neighborly appearance of the wire fencing, it has the decided advantages of fireproof qualities, increased air space, unobstructed sunlight and improved sanitation, resulting in improved natural conditions for the cultivation of flowers and vegetables, and increased attraction as a children's playground. In these days of intensive vacant lot and back yard gardening, the board-fenced back yard is at a distinct disadvantage for agricultural purposes as compared with the wire-fenced yard, which gets the full play of the sun and wind. It has been further proved that the introduction of wire fencing in back yards increases the rental value of the property and attracts a better class of tenants

Photographs by courtesy of Cyclone Fence Company

Municipal Departments Rely Upon Motor Apparatus for Efficient Service

FIRE STATION AT TONDO, MANILA, PHILIPPINE ISLANDS

AUXILIARY HOSE CAR, MOUNTED ON STUDEBAKER CHASSIS, WITH GOODRICH PNEUMATIC TIRES, SANTA CRUZ, CAL.

This car carries about 1,000 feet of 2½-inch hose and 100 feet of 1½-inch hose; also Babcock extinguishers

FEDERAL TRUCK OPERATED BY THE TELEGRAPH CORPS OF THE DETROIT FIRE DEPARTMENT

Equipped with a power-driven winch for pulling cable thru manholes

Courtesy of Firestone Tire and Rubber Company

STREET FLUSHING MACHINE USED BY THE STREET CLEANING DEPARTMENT, NEW YORK CITY

Weight 15 tons when fitted; the flushers, at the front and sides of the machine, are operated by the driver

Modern Lighting Method

THE OLD WAY

Two sets of poles.

Tubular steel for supporting trolley wires.

Cast iron standards for lighting.

DOUBLE EXPENSE

Unnecessary obstruction along the curb line.

Underground wiring absolutely necessary.

Difficulty of keeping both sets of poles in alignment.

THE ELRECO WAY

One set of Elreco combination pol

The addition of ornamental brack and base transforms the ordinary pla trolley pole into a handsome lighti standard.

"White Way" is obtained at less th one-half the cost of a separate instal tion.

Lighting wires may be attached top of poles—saving all expensi underground construction.

Curb line free from all unnecessa obstruction.

Get full details and catalog

Electric Railway Equipment Co.

Manufacturers **Cincinnati, Ohio**

NEW YORK OFFICE **30 CHURCH STREET**

News and Ideas for Commercial and Civic Organizations

The Americanization Movement in Rochester

ROCHESTER, N. Y.—The problem of Amercanizing the foreigner has received considerable attention in Rochester, and the work is proceeding in a very satisfactory manner. It was undertaken by the Rochester Chamber of Commerce at the suggestion of the Chamber of Commerce of the United States of America, also at the suggestion of Charles E. Finch, director of Immigrant Education for the local Board of Education. The educational authorities in Rochester felt that it was very necessary to have the coöperation of local business interests in strengthening the efforts which had been made in a limited way to Americanize the foreign-born population of the city. The Chamber of Commerce therefore got behind the movement in a systematic and energetic manner thru its Americanization Committee, which held its first meeting in January, 1916.

Public meetings in the interest of Americanization were held during 1916 and 1917. Those held indoors were attended to the full capacity of the Convention Hall—that is, by approximately 4,000 persons; while those held outdoors—that is, the Independence Day mass meetings in the Exposition Park—were attended by audiences of 4,000 and 15,000 respectively.

A survey of the foreign-born workers in the industries was conducted and a coöperative committee was formed, representing all the agencies that touch the life of the foreigner. As sub-committees of this coöperative committee (which is an auxiliary of the Chamber of Commerce committee), factory Americanization committees were formed to work among their fellow employes. This made it possible to cover the field rapidly and effectively. At a meeting of the Americanization Coöperative Committee, held in November, reports were received from the various factory committees which indicate with what thoroness and determination the Americanizing work is being done. The following are the most important of the activities of the factory committees, as stated in the reports:

The names of all foreign-speaking employes have been listed according to language, and these lists apportioned to members of the factory committee, each of whom will interview the individuals on his list and try to induce them to learn our language, go to night school and become citizens.

Meetings have been planned where all foreign-speaking employes will be addressed on Americanization, urged to learn our language, go to night school and become citizens.

Meetings have been arranged in which foreign-speaking employes are to be addressed in their own language.

A census of foreign-born employes has been taken, and all pertinent information as to nationality, language, intention of becoming naturalized, knowledge of English, etc., has been listed, so that the factory committee may know precisely what there is for it to accomplish.

Prizes have been offered by one firm, as follows: for the person having the best attendance at night school, $5; for all who attend over 80 per cent of the lessons in night school course, $1:

Stories have been run in house organs giving reasons why aliens should be naturalized and learn our language.

Announcements of night school classes have been printed in programs of Italian social clubs.

Employes have been informed that those who speak English and are United States citizens will have preference in advancement and promotion, aliens always being equal.

Messages to foreign-born, urging them to learn our language, go to night school and become citizens, have been printed on pay envelopes.

Posters have been placed on factory bulletin boards announcing night school classes.

Announcements of night school classes have been handed to foreign-speaking employes.

Intention papers (first papers) have been furnished by the committee, and employes have been given assistance in filling them out.

An added incentive to learn the English language was given to the employes in one factory by organizing a social club among them, membership in which is open only to those who can write their own names and read the constitution of the club in English.

PROTECT YOUR SEWERS

BY INSTALLING

THE OTTERSON AUTO-EDUCTOR

The New and Sanitary Method of Cleaning City Catch Basins

CLEAN CATCH BASINS PROTECT SEWERS

In another factory, all employes who desire to take out their first papers meet in the factory's office at 11.30 every Friday morning, where they are helped to fill out the blanks. When that work has been completed, they are accompanied in a group to the Naturalization Court. The entire operation requires only half an hour, and the time consumed is charged to the factory, not to the employe.

Citizenship classes, from which pupils are properly graduated, are conducted in the public schools. The Chamber of Commerce sends to the employers a statement of the attendance of their employes at night school, and the employers follow this up by commending those who attended night school regularly and ascertaining the reason for the poor attendance of others.

The program for the present year has been greatly enlarged, and it is proposed to wage a city-wide campaign against illiteracy upon the foundation so successfully laid during the year 1917.

ROLAND B. WOODWARD,
Secretary, Rochester Chamber of Commerce.

Editorial Note.—Bulletins Nos. 15, 16, 17 and 18 of the Immigration Committee of the Chamber of Commerce of the United States, of which Frank Trumbull is chairman (address 29 West Thirty-ninth Street, New York City), contain valuable information regarding the activities of state and local organizations in war Americanization work.

A Comprehensive War Council

Providence, R. I.—In forming the War Council of the Providence Chamber of Commerce, an endeavor was made to have the composition such as to prevent the overlapping and duplication of efforts which always result in waste of time, energy and money. It was desired, too, that the Chamber of Commerce should not lay itself open to the accusation of trying to manage all the war business of the city and to get all the glory and credit. To that end, therefore, the membership of the War Council was drawn from other organizations beside the Chamber of Commerce. For example, the president of the Rotary Club, who is not even a member of the Chamber of Commerce, is one of the most active members of the War Council. Members were also drawn from the Economic Club, the state fuel and food commissions, the Red Cross, the press, and other bodies. Already the presence of representatives of these various organizations in counsel together has prevented much duplication of work, which would otherwise have been an annoyance to the entire community.

The General Secretary of the Providence Chamber of Commerce is the Secretary of the War Council, and he will be glad to answer any questions which may be addressed to him in regard to the operations of the War Council.

CLARENCE A. COTTON,
General Secretary, Providence Chamber of Commerce.

New Citizens Welcomed

Schenectady, N. Y.—The Schenectady Board of Trade gave a strong impetus to the Americanization movement late last fall by holding a reception for the 146 aliens who had passed examinations in the local naturalization court. These aliens were made American citizens and given their certificates of citizenship on that occasion in an inspiring and impressive ceremony. The reception was held in the auditorium of the Schenectady high school.

The following interesting program was presented, to which the high school orchestra contributed the opening number. This was followed by an invocation, "opening remarks," a vocal solo, an address on citizenship, and another selection by the orchestra. The oath to the new citizens was next administered by the County Judge. Then came the presentation of the certificates of citizenship by the Naturalization Clerk, and the presentation of badges to the new citizens and their wives. The orchestra then led the audience in the singing of "America." The benediction was pronounced by one of the local ministers.

Many of the wives of these new citizens were present, and they received their share of attention, because they automatically became citizens at the same time as their husbands, by virtue of the right of suffrage given to the women of New York State at the recent election.

Each newly made citizen received the oath of citizenship standing, with his right hand raised, and repeated the oath in sections as it was read to him by the County Judge. A small flag and a picture of President Wilson were also given to each one. Flashlight pictures were taken of the gathering, which the federal authorities in Washington planned to use in spreading the

PACKARD TRUCKS

"All four have done remarkable work" was said of city-owned Packards.

"After a thorough and careful investigation of various makes of motor trucks, the Board of Commissioners of the Port of New Orleans purchased four Packards in 1915," says Chief Engineer J. D. O'Reilly.

"The two three-tonners are used in repair and construction work on the river front. The four-tonners equipped with special bodies, handle cotton.

"*Stated simply, all four of these trucks have done remarkable work.*

"Their low maintenance cost and dependable, efficient service have justified the amount paid by the Board in excess of the prices at which other equipment was offered us."

More than ever before municipalities *now* have special need of the *self-contained* and economical hauling service which Packard trucks provide. Silent, chainless, seven *right* sizes. Write Packard Motor Car Company, Detroit. *Ask the man who owns one.*

Packard

Americanization spirit thruout the country. Everyone present appeared to recognize the patriotic significance of the event and manifested fine enthusiasm in the ceremony.

The reception committee was composed of representatives of the Schenectady Women's Federated Clubs, the Home Defense Corps, the Woman's Suffrage organization, and the Americanization Committee of the Schenectady Board of Trade.

H. W. RAYMOND,
Secretary, Schenectady Board of Trade.

A STRETCH OF GOOD ROAD NEAR MEMPHIS, TENN.

A Comprehensive Highway Development Program

Memphis, Tenn.—The Good Roads Committees of the Memphis Chamber of Commerce, the West Tennessee League of Business Men's Clubs, and certain business men's clubs of North Mississippi have been tireless in their efforts to bring about the improvement of the highways in the Mississippi Valley. The Bankhead National Highway Association, organized in Birmingham in October, 1916, with the assistance of the Chambers of Commerce of Memphis and Atlanta, has made rapid strides in the building of a military road from Atlanta to Memphis, thence to Little Rock and Fort Smith, Ark. The financial arrangements for the construction of this road from Atlanta to Memphis have already been completed, and within the next few months the financing of the road from the Mississippi River to Fort Smith will be well under way.

There are fourteen highways radiating from Memphis. The principal ones are the Jefferson Davis, the Memphis-Yazoo Delta, the Mussel Shoals, the Bankhead National, the Memphis-to-Bristol, the Evergreen Trails, the Ozark Trails, the Memphis-to-Shiloh Park, the Memphis-to-Louisville, and the Southern National. Two large good-roads conventions have been held in Memphis during the last few months. An unusually strong desire for the early construction of permanent roads has been manifested by the residents of this section, as is proved by the numerous conventions and meetings in the interest of good roads that have been held thruout the territory. The formation of road improvement districts and the successfully carried out plans for raising money for the construction of main automobile highways, both by the issuance of bonds and by increased taxation, are further evidences of the great interest shown. Tennessee has recently enacted a law which levies a one-mill direct tax upon the property owners, the income to be applied exclusively to the construction of roads. By this means, money will be raised to meet the requirements of the Federal Aid Law, and many applications will be made without delay for money from the National Government. These highway associations will build the roads according to the specifications of the United States Agricultural Department, and guaranties of maintenance will be furnished.

Transcontinental touring has increased so rapidly within the last few years that the

GMC TRUCKS

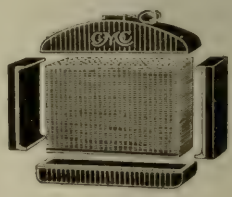
When There's City Work To Do—GMC

When there is city work to do, no matter in what department—no matter what the character of the work may be—there is a GMC Truck that will fit.

The work may be heavy or light, cumbersome or rapid—no matter—there is a GMC Truck with ruggedness or speed enough, as the case may be.

In building trucks GMC engineers have built for practical service. The six sizes are practical sizes—each better fitted than any of the other models for the work.

And every vital part is built with the expectancy that it will be called on for more than its rated stamina. Every vital part is oversize and overstrong.



THE RADIATOR

Proper cooling means highest engine efficiency. Many factors must be taken into account. They are.

Radiation surface — water and air circulation—strength of materials—solidity of assembly and mounting.

The GMC radiator is the continuous fin type, vertical brass tubes. Water is forced. A four-bladed fan forces air circulation.

The GMC radiator is adapted to all climates and altitudes.

Write to *Truck Headquarters.*

GENERAL MOTORS TRUCK COMPANY

One of the Units of the General Motors Corporation

New York Boston Philadelphia — PONTIAC, MICH. — Chicago St. Louis San Francisco

(308)

directors of the Memphis Chamber of Commerce have found it necessary to establish a special bureau in their building to give information and assistance to motorists. The dining-room, club rooms, reading-room and bathrooms are thrown open to them, and every effort is made to make their stay in Memphis a pleasant one.

HENRY HAYLEY,
Chairman, Good Roads Committee, Memphis Chamber of Commerce.

A Successful Curb Market

Middletown, N. Y.—The Market Committee of the Middletown Chamber of Commerce was responsible for the very successful curb market which was operated in Middletown last year. As many as sixty-eight farmers—actual producers—had their wagons backed up to the curb at one time, and some of them came as far as twenty miles to Middletown with their produce. The market days were Tuesday, Thursday and Saturday, and the market was run from June 1 to November 15. A photograph of the market accompanies this item. The prices charged have not been much lower than those charged at the retail stores, altho the existence of the curb market did cause the retail merchants to reduce their prices for fresh produce 25 per cent in some cases.

The City Council of Middletown is considering the appointment of a Market Commissioner, who would take the responsibility of running the curb market off the hands of the Chamber.

The Middletown Chamber of Commerce is well satisfied with the market, and will be glad to furnish information concerning its operation to any commercial organizations that may be interested.

G. D. THELEEN,
Commissioner, Middletown Chamber of Commerce.

THE CURB MARKET AT MIDDLETOWN, N. Y., ON ONE OF ITS BUSY DAYS

A Community Planting Bee

St. Charles, Mo.—The community spirit in St. Charles was aroused to its highest point when the Civic Bureau of the Chamber of Commerce, on November 9, 1917, carried out its plans for a community work day.

St. Charles is the meeting point of five cross-continent highways, and at the point where these highways converge, just at the city limits, are located the city reservoirs and water tower. Surrounding these is Water Tower Hill Park, a tract of about ten acres—really a park in the making. Several days before November 9 the citizens gave to the St. Charles Chamber of Commerce lists of the flowers, trees and shrubs which they were willing to donate toward beautifying Water Tower Hill Park. The contributions were collected by truck owners, who volunteered for this service, during the afternoon of the day before they were to be planted.

It had also been arranged that high school students should make an excursion over the country roads on the morning of community work day in search of wild roses, wild shrubs and anything else of beauty which could be planted in the park. So, promptly at seven o'clock in the morning, one hundred high school boys started out in groups of five, each group in charge of a citizen who was familiar with plants. By eight o'clock other volunteers, with their auto-

This 1½-ton Federal owned by the Brooklyn Department of Parks is daily demonstrating Federal low cost of operation. Other Federals are duplicating its performance throughout the country.

Nineteen Thousand Seven Hundred Miles with a Total Repair Expense of Only $68.33

Here's more proof of Federal economy of operation in municipal service.

This Federal, owned by the Brooklyn Department of Parks, has been in operation for one year, eleven months and in that period ran 19,700 miles with a total repair expense of only $68.33.

This is a graphic illustration of the kind of service Federals are giving throughout the country.

It is further proof of the rugged strength, the genuine durability, combined with economy of operation that has created the big demand for Federal Motor Trucks among municipalities.

"Federal Traffic News" is just what its name implies—it's a meaty little publication that will show you what motor haulage is accomplishing in the transportation field.

Federal Motor Truck Co.
342 Federal Street Detroit, Mich.

FEDERAL

One to Five Ton Capacities

mobiles, had arrived at the various places where the boys were working and had begun hauling the shrubs to the park.

In the meantime, three or four hundred men and women of St. Charles, and perhaps four or five hundred public and parochial school students, all volunteers, assembled at Water Tower Hill Park, where they undertook the work of planting the mound surrounding the reservoirs. The work was done according to the plan of a landscape architect, which was donated by the Stark Brothers Nurseries and Orchards Company of Louisiana, Mo. That company also gave several hundred trees and shrubs.

Besides the school children, the participants included city officials, business men, members of the Chamber of Commerce, members of the Women's Club, professional men, Lindenwood College students—in fact, the majority of the city's population, who were busy digging and planting the entire forenoon. F. C. Becker, director of the Civic Bureau of the Chamber of Commerce, was in charge of the work. By noon a little less than one-half of the plot had been planted, and the workers were still very enthusiastic. Promptly at twelve o'clock all the workers laid down their tools and ate the lunch which was served by the Anti-Tuberculosis Committee of the Civic League. The afternoon saw more workers at the park, with the most difficult part of the undertaking ahead of them. Those who had worked during the morning and had not planned to work during the afternoon were so interested that they called up their offices and informed their subordinates that they would be away for the remainder of the day.

Hundreds of machine loads of beautiful shrubs and flowers arrived at the park during the afternoon, and when five o'clock came, weary backs straightened with a feeling of satisfaction that the planting had been completed. The result of this work will not be seen until next spring, but the spirit engendered at that time has already made itself evident.

The total cost of community work day was less than five dollars, which includes every incidental expense which the Chamber of Commerce of St. Charles had to bear.

HUGH H. MACE,
Secretary-Manager, St. Charles Chamber of Commerce.

THE SCENE OF THE PLANTING BEE AT ST. CHARLES, MO. THE CITIZENS ARE BEAUTIFYING THE SLOPE OF THE RESERVOIR IN WATER TOWER HILL PARK

A Means of Preserving Man-Power

Davenport, Iowa.—In order to coöperate with the government in its campaign for

Saves 35% for the City of Milwaukee

IN June, 1915, the City of Milwaukee ordered a Sterling-Kindling Motor Squeege Street Washer. After keeping accurate cost data it was found that this outf cleaned 1000 yards of asphalt pavement at a cost of only 16½ cents — a saving 9 cents, or 35 per cent over horse-drawn equipment. Consequently this secon Sterling-Kindling outfit was installed in April of this year.

The Sterling-Kindling can easily be converted into a general utility truck. It is so designed that the tank can be quickly demounted and a dumping or stationary body easily attached.

The entirely enclosed and protected mechanism of the chassis means long life and greater freedom from operatin troubles.

The Sterling-Kindling Motor Squeegee n only *economizes* but it also *advertises* a m nicipality as progressive in civic enterpris

WRITE TODAY FOR FULL INFORMATION SHOWING EQUIPMENT FURNISHED AND ECONOMIES EFFECTED

Sterling TRUCKS

STERLING MOTO TRUCK COMPAN

Builders of Motor Trucks Exclusively For Nine Years

830 ROGERS ST., MILWAUKEE, WI

the elimination of waste and the preservation of man-power, the retail merchants of Davenport adopted a system for use among their customers which became effective on November 1, 1917.

The retail grocery stores have adopted the slogan, "Order the goods to-day that you want to-morrow." It is believed that if the grocers use this slogan with their customers, the people will learn to order their groceries in larger quantities and thereby eliminate the delivery of trifling purchases.

The other retail merchants are using the slogan, "Goods purchased to-day will be delivered to-morrow." It was thought that people ordering goods would not care to wait until the next day for the delivery, and would in most cases carry their packages home with them. The adoption of this plan also means that the merchants are able to cut down their deliveries to two a day. And people ordering goods sent by special delivery are required to pay for this service.

IRVING C. NORWOOD,
Secretary, Greater Davenport Committee.

Proportional Representation in Chamber of Commerce Election

Bethlehem, Pa.—Proportional representation as a method of election invaded a new field when the recently organized Bethlehem Chamber of Commerce made use of the plan to elect the fifteen members of its Board of Directors on December 19 last. By this plan every group, comprising one-fifteenth or more of the membership, is enabled to secure representation on the Board about in proportion to its numbers.

Nominations were made by petition of five members of the organization. No member was permitted to nominate more than one person. Altogether, fifty-eight were nominated. The instructions on the ballot were as follows:

HOW TO VOTE

1. Put the figure 1 opposite the name of your first choice. If you want to express also second, third and other choices, do so by putting the figure 2 opposite the name of your second choice, the figure 3 opposite the name of your third choice, and so on. You may express thus as many choices as you please.

2. This ballot will not be counted for your second choice unless it is found that it cannot help your first; it will not be counted for your third choice unless it is found that it cannot help either your first or your second; etc. The more choices you express, the surer you are to make your ballot count for one of the candidates you favor.

3. A ballot is spoiled if the figure 1 is put opposite more than one name. If you spoil this ballot, tear it across once, return it to the election officer in charge of the ballots, and get another from him.

4. Polls are now open at the Executive Offices, City Realty Building, and will close at 6 P. M., Wednesday, December 19.

5. Ballots may be mailed or delivered by messenger or in person.

6. They will be counted at an Election Smoker to be held at the Colosseum, Wednesday, December 19, at 8 P. M., to which every member is invited.

The adoption of this new method of voting aroused a great deal of interest in the organization and in the community at large, and the experiment may be regarded as extremely successful. Copies of the forms used for nomination petitions and election ballots may be obtained on application to the Chamber of Commerce at Bethlehem, Pa.

The Honor Roll of Washington, Pa.

Washington, Pa.—The War Aid Committee of the Washington Board of Trade is maintaining a roster of all the men who have gone to the service of the country from this city. The record is in the form of a card-index and gives information regarding the men that will prove to be valuable in the years to come, whether the men survive the war or not. The list is accessible to any of the residents of the community who wish to consult it, and it has even been of service to the War Department, in supplying the address of a man for which the Department telegraphed recently. The card, showing the character of the data which are being secured, follows:

Name .....
Age .....
Home address (street and number).....
Regiment .....
Company .....
Present address .....
Date of mustering in.....
Place of enlistment.....
Branch of service.....
Rank .....
Names of nearest relatives.....
(State relationship)
Address of nearest relatives.....

The newspapers are coöperating with the Board of Trade in its efforts to secure this information by printing the card in full, and, in a statement accompanying it, asking

Dependable Hose

Fire hose must be reliable.

On it rests not only the safety of property but the lives of your firemen.

Republic Fire Hose is always dependable.

It is made by skilled workmen of the best of materials.

There are several brands of Republic Fire Hose.

Each one is worthy of the Republic Quality trade-mark.

Republic Fire Engine Suction Hose is light and flexible and will withstand the most severe pumping strain

The Republic Rubber Corporation
Youngstown, Ohio
Branches in all principal cities

those interested to fill out the blanks and to mail or deliver them to the War Aid Committee of the Board of Trade or to the newspaper offices.

As one of the features of the Washington Community Christmas observance, in which the Civic Bureau of the Board of Trade took the initiative, as formerly, the Christmas greetings of the Washington community were sent to all the men and boys on the roster. A reproduction of the the card of greetings accompanies this item.

To Our Soldier Boy:

Of course we know that you are thinking of home today and we want to tell you that the folks of your old home town are likewise thinking fondly of you. We miss you everywhere we turn, but are proud that you have so bravely offered to help Uncle Sam finish the big job he has shouldered of winning this war.

You don't know how glad we should be to take you by the hand today and tell you how much we home folks appreciate the sacrifices you are making for us. We are trusting you to so bear yourself in every circumstance as to bring honor to yourself, your home, your country and your God.

We shall back you every minute with our love and sympathy and all that we have. Standing together loyally we may confidently expect the final triumph of our righteous cause.

Faithfully Yours,

December 25, 1917 Washington, Penna., Home Folks

A GREETING FROM THE WASHINGTON, PENN., HOME FOLKS TO THEIR MEN IN THE SERVICE

A message such as is contained in this Christmas greeting would be welcomed by our men in arms at any time, especially when sent by an organization with which the man had been identified before he went to war. It could be modified to suit the occasion, and would not fail to have a heartening effect.

WARREN R. JACKSON,
Managing Secretary, Washington Board of Trade.

Committees Mobilized for War Service

Johnstown, Pa.—Realizing that while the United States is at war it will more than ever need the coöperation of the commercial and civic organizations thruout the country, the Johnstown Chamber cast about for some means of awakening its committee members to the real importance of their work. The plan that was finally evolved has resulted in developing more enthusiasm among the various committees than has ever before been apparent.

The first Committee War Council of the organization was called together at an evening dinner, held in the Merchants' Hotel, with only the Board of Directors, the committees and the executive staff present. The Directors and the committees were grouped, each at its own table. During the evening, reports of the year's activities of each committee were submitted, and an outline of contemplated activities was presented in every case. One of the members of the Board of Directors gave an address in which he drew attention to the particular phases of the Chamber's work upon which emphasis should be placed in order to help the Government most in times such as these. The most important work he felt to be that of a hearty and complete coöperation in the Liberty Loan, War Savings Stamp and certificate campaigns and other government activities, and in the Red Cross work and all other forms of war relief. He laid special emphasis on the importance of continuing the work for good roads, better housing and the annexation of the boroughs contiguous to the city.

The result of the reading of the committee reports was surprising. Just how much community betterment work means to a city can scarcely be appreciated until the details are brought out in such a manner as this, and the committee workers went away from the meeting with a new and clearer realization of how important their work is to the organization, the city and the nation.

One feature of the occasion that made a strong appeal and helped to create the patriotic atmosphere which surrounded the meeting was the unveiling, at the outset of the dinner, of a tablet inscribed with the names of the members "over there" or in the service in this country.

To further drive home a realization of the importance of the Chamber's work, President Wilson was communicated with by wire before the meeting was held and was asked for a message that could be read

Amercian-LaFrance Motor Fire Apparatus at Camp Dix, Wrightstown, N. J.

THE NATION'S EFFICIENCY IN THE PRESENT CRISIS

The nation's efficiency in the present crisis depends upon the ability of its industries to produce war materials and supplies, and to continue to do so without interruption.

The burden of protecting the industries of the country against delays and stoppage of production by fires rests upon the Fire Departments. Fire Departments efficiency depends largely upon the reliability and quality of its Fire Fighting Apparatus. *The Best is None too Good.*

Up to this date this company has furnished the United States Government with the following motor fire apparatus:

18 Pumping Cars
38 Chemical Engines
6 Combination Cars
1 Service Truck

—as well as some 200 hand-drawn chemical engines and several thousand hand extinguishers.

AMERICAN-LAFRANCE FIRE ENGINE COMPANY, INC.

Members of the National Automobile Chamber of Commerce. Licensed under the Dyer Patents

Elmira, New York, U. S. A.

Branch Sales Offices and Service Stations

New York Boston Chicago San Francisco Portland, Ore. Dallas
Los Angeles Atlanta Denver Pittsburgh Baltimore Minneapolis

CANADIAN FACTORY, TORONTO, ONT.

to the dinner guests. The following letter was received from Secretary Tumulty:

"Mr. G. W. Lemon,
Secretary Chamber of Commerce,
Johnstown, Pa.

My dear Sir:

In reply to your telegram of December 5, the President asks me to state that he should regret to see any instrumentality neglected which has proven serviceable in stimulating business and facilitating its processes. This is not a time to allow any slowing up of business, but it is a time when every sensible process of stimulation should be used.

Sincerely yours,
(Signed) J. P. Tumulty,
Secretary to the President."

A war-time get-together for the entire membership is now being arranged as a sort of follow-up, which will no doubt prove to be beneficial.

L. W. Barclay,
Assistant Secretary, Johnstown Chamber of Commerce.

New Bulletins

Battle Creek, Mich.—*What is What in Battle Creek, Mich.*, "a bulletin of business," to be issued monthly by the Battle Creek Chamber of Commerce.

Carlisle, Pa.—*Commercial and Civic Carlisle*, the official organ of the Carlisle Chamber of Commerce. To be issued monthly.

New Brighton, Pa. *Think*, the official bulletin of the New Brighton Chamber of Commerce, to be published monthly in an effort to make its members think right and constructively.

Salem, Ohio.—The *News Letter* of the Salem Chamber of Commerce, to be published occasionally.

Three Forks, Mont.—*Farm Exchange Bulletin*, issued monthly by the Three Forks Chamber of Commerce, with the object of making the farmer more prosperous.

Titusville, Pa.—*Chamber of Commerce Bulletin*, to be published monthly by the Titusville Chamber of Commerce.

Wilson, N. C.—*Community Interests*, the official organ of the Wilson Chamber of Commerce, to be published monthly.

Recently Issued Printed Matter

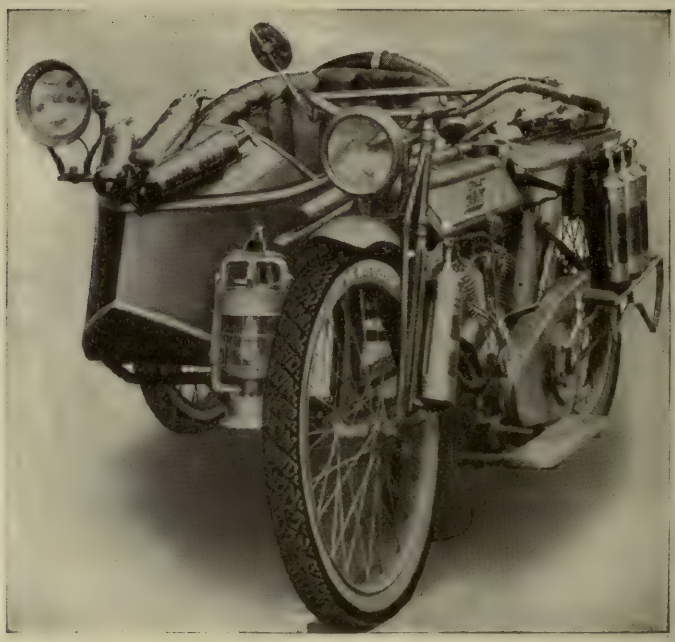
New York City.—Special attention is called to Bulletins Nos. 15, 16, 17 and 18, issued by the Immigration Committee of the Chamber of Commerce of the United States, which contain reports regarding the activities of state, county and city defense councils, and local commercial organizations, in war Americanization work. Data is given concerning both civic and industrial Americanization work. Copies of the bulletins may be obtained by addressing the chairman of the committee, Frank Trumbull (29 West Thirty-ninth Street, New York City), who will also be glad to furnish information to anyone requesting it in regard to the organization of Americanization activities.

New York City.—"Spreading the Gospel of Patriotic Industrial Coöperation" is the title of a pamphlet issued by the National Industrial Conservation Movement, whose headquarters are at 30 Church Street, New York City.

South Bend, Ind.—"South Bend, a City of Opportunity," is the title of a handsome booklet measuring 10 x 14 inches, just issued by the Publicity Bureau of South Bend Chamber of Commerce. It contains many fine illustrations, a brief history of South Bend, chapters on the city government, the city's industries, wholesale and retail, also on the city's federation for social service, its recreation facilities, and information on other subjects of interest to the citizens.

St. Paul, Minn.—"Housing Conditions in the City of St. Paul," the report presented to the Housing Commission of the St. Paul Association by Carol Aronovici. This is a comprehensive report of the housing survey, handsomely gotten up, and contains graphic illustrations of conditions discovered when making the survey. It gives information on the condition of repair of the buildings; on the toilets and baths; on the sewers and water supply; on garbage, ashes and rubbish; on lighting and ventilation; on the lodger problem; on the lodging, rooming houses and hotels; on the valuation of properties and revenues; on the relation between housing and other social conditions, and an analysis of the laws in certain cities and states thruout the country presented in comparative form with those of the city of St. Paul, for the purpose of furnishing a basis upon which to meet the deficiencies of the laws and ordinances affecting the housing of St. Paul. Finally, it contains the several provisions of the Housing Ordinance of the City of St. Paul. The price of the report is 50 cents. (Address the secretary of the St. Paul Association.)

The proceedings of the tenth annual convention of the Southern Commercial Secretaries' Association, held at Knoxville, Tenn., May 2-5, 1917, have recently been issued. Among the many interesting papers presented are noted the following: "A Divided Town: How to Avoid and How to Correct," by B. F. Johnson, of the Chamber of Commerce of Wichita Falls, Tex.; "The Organization and Its Relation to the Town," by W. B. Royster, of Griffin, Ga.; "Public Opinion Molding in the Interest of the Public," by Walter Parker, General Manager of the New Orleans Association of Commerce; "Methods of Coöperation with the Department of Agriculture," by Morgan Richards, of Selma, Ala.; and "The Relation of the Commercial Organization to its Agricultural Territory," by C. W. Roberts, of Gastonia. (Apply to the secretary of the Southern Commercial Secretaries' Association, B. F. Johnson, Wichita Falls, Tex.)



Speed to Fires ON Firestone Tires

FIRESTONE Tires carry this Thor machine completely equipped at high speeds safely, dependably. Extra strain and extra weight can't stop Firestone Tires. They perform splendidly in the most difficult service.

Firestone has proved Most Miles per Dollar on all kinds of fire apparatus, heavy and light. Call on the Firestone man of your city or write us for facts about complete line.

FIRESTONE TIRE AND RUBBER COMPANY
Akron, Ohio—Branches and Dealers Everywhere

Firestone

PNEUMATIC OR SOLID TIRES FOR HORSE OR MOTOR-DRIVEN VEHICLES

The Water Purification and Softening Plant at Great Falls, Montana

By R. E. McDonnell
Consulting Engineer, Kansas City, Mo.

GREAT FALLS. MONT., with a population of about 30,000, has for years used raw Missouri River water for both domestic and fire purposes. The agitation for a pure water supply has extended over a period of about ten years, and was due to the fact that the water was very turbid at certain seasons of the year and the typhoid cases in the city were also above normal. About two years ago the Montana State Board of Health took an active interest in the health conditions of the city, believing that much of the typhoid was due to the use of Missouri River water without adequate purification.

EXTERIOR VIEW OF FILTER AND CHEMICAL HOUSE, GREAT FALLS, MONT., WATER PURIFICATION PLANT

Securing the Bond Issue

One bond issue for the installation of a filtration plant was defeated, but the defeat was attributed largely to the fact that information concerning the beneficial results of filtration and the cost of purifying water was not clearly and fully presented to the citizens. To avoid the mistakes made formerly, the citizens undertook to inform themselves thoroly as to the value of pure water, the cost of filtration and the beneficial results of filtered water, and a campaign of education was conducted thru the influence of the Commercial Club, the Rotary Club, the women's clubs and other civic organizations. At one stage of the discussion it was found that the women voters of the city would be against the bond issue for filtration unless it also included water softening; so to insure the success of the bond issue the plans were made to provide for a combined water softening and purifying plant. Altho the water is not unreasonably hard, the desirability of a softer water was felt by the women voters.

After bonds had been voted for the project, the engineers employed by the city were instructed to prepare plans and specifications to cover both water softening and purification. A citizen's committee was appointed outside of the City Council to take charge of the execution of the work,

—yes, some twenty years ago

Twenty years ago, we made a big lot of Enameled Iron Street Signs for the City of Baltimore, but we haven't sold the City many since—only because

THE TOWN HASN'T NEEDED THEM

The signs we sold them twenty years ago are still doing business—that's the economy of "BALTO" Guaranteed Porcelain Enameled Iron Municipal Signs.

That's the proof that there is no "just-as-good."

If you can afford to experiment with low prices (?) you're fortunate, but the taxpayer pays the freight. Our product is the one absolutely dependable out-of-door municipal sign on the market, and we can prove it if given half a chance.

GIVE US THE CHANCE TODAY

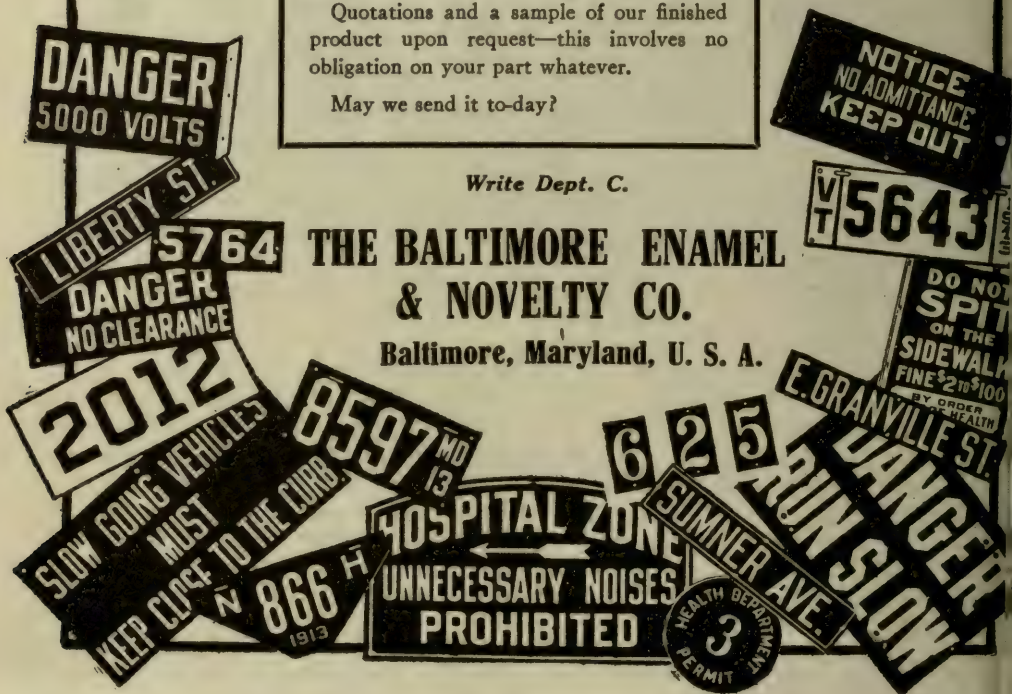
Quotations and a sample of our finished product upon request—this involves no obligation on your part whatever.

May we send it to-day?

Write Dept. C.

THE BALTIMORE ENAMEL & NOVELTY CO.

Baltimore, Maryland, U. S. A.



nd this committee passed upon the plans, pecifications, receiving of bids, final tests nd other details of the entire work.

Construction and Equipment

The improvement consists of an electric-lly operated low service pumping station hich takes water direct from the Missouri iver and discharges it into a mixing cham-er, where the chemicals are added and ixed with the water previous to its pass-ig into the settling basins. After passing iru the settling basins, the water flows into ight 1,500,000-gallon filter units; thence ito the clear water reservoir.

The electrical pumping station equipment onsists of four motor-driven centrifugal umps, two 2,000,000-gallon pumps and two ,000,000-gallon pumps, or a total of 12,-00,000 gallons pumping capacity.

The filter house, chemical house and head ouse are of buff-colored pressed brick ex-rior with steel roof trusses. Considerable rnamentation was given to the exterior nd interior of the filter house building, ith the idea that the plant will be visited nd inspected not only by the citizens of reat Falls, but by many representatives f other municipalities.

THE MIXING CHAMBER

The purification plant consists of, first, reinforced concrete mixing chamber; and, wing to the softening requirements, the ixing chamber was designed with a view a thoro mix and a long travel of the ater before passing into the settling asins. To insure the water passing thru e mixing chamber and to overcome the ss in friction thru baffle walls, the mix-g chamber stands at a level about three et higher than the settling basins. The avel thru the mixing chamber is 1,660 et, giving thirty-six minutes in the mix-g chamber when pumping at the rate of ,000,000 gallons per day. When pumping a greater or less rate, the length of travel nd velocity thru the mixing chamber can regulated by changing the baffle walls cutting out a portion of the mixing cham-r. The velocity of 0.77 feet per second ru the mixing chamber prevents the de-osit of any sediment. The thoro mixing at is given in the mixing chamber accom-ishes considerable clarification before the ater even reaches the end of the mixing amber. The water has a retention period about eight hours in the settling basins when operating at the rate of 12,000,000 gallons per day.

Experiments were conducted for about thirty days to determine the minimum amount of chemicals that could be used to obtain the most efficient results. It was found that from 0.6 to 0.7 grains of sulphate of iron was required for thoro clarification during ordinary stages of the water. This quantity will undoubtedly have to be increased during the highest turbidity stages of the water. Altho the natural lime in the water is small, yet with the thoro mixing accomplished in the mixing chamber it was found that it was not necessary to add lime to the water, and the omission of lime is a large saving in the annual cost of operation.

CHEMICALS APPLIED BY DRY FEED MACHINES

Chemicals for both water purifying and softening are applied by dry feed machines connected with a Venturi meter and so arranged that the chemicals fed are in direct proportion to the water used.

At Great Falls, as in most cities, the volume of water pumped during the twenty-four-hour period varies greatly at different portions of the day. The water consumption at Great Falls varies from 2,000,000 to 12,000,000 gallons per day, and the dry feed machines automatically control the chemicals, thus having the proper amount of chemicals for the water used.

A complete softening of the water is not attempted, as the water is not unusually hard, but a partial softening is accomplished at reasonable expense, the soda ash for softening being also fed by a dry feed machine and into the mixing chamber along with the sulphate of iron and lime.

The chemicals for the plant are purchased in carload lots and hoisted by electric elevator to the fourth floor of the chemical house, where they are placed on top of concrete hoppers which lead to the hopper of the dry feed machines on the floor below.

CONCRETE COVERED SETTLING BASINS

The settling basins are 18 feet deep, 160 feet wide and 180 feet long, having reinforced concrete slab covers. The floors consist of two layers of concrete with waterproofing between the joints. Two reinforced concrete 6-inch baffle walls extend the full length of the basins, which are di-

MOTT LAMP POSTS

STANDARDS OF MERIT

Special Designs of Lighting Standard For Type C Lamps

LAMP POSTS FOR ALL REQUIREMENT

FOUNTAINS

Display and Drinking

For PUBLIC SQUARES, PARKS, PLAYGROUNDS, Et

ENTRANCE GATES, RAILINGS, SETEE

CATALOGUES ON APPLICATION

THE J. L. MOTT IRON WORKS

Fifth Avenue and 17th Street, New York

CITY OFFICERS

AUDITORS, CLERKS, ENGINEERS, SUPERINTENDENTS OF STREET

Do away with waste of time and the possibilities of costly errors by using

Speed

Accuracy

Ease of

Operatio

The New Pony Marchant Calculator

The Marchant is used throughout the United States in the following classes of calculation Tax Extension, Decreasing or Increasing Valuations, Figuring Interest on Tax Delinquencie Apportioning Funds of Treasurer, Apportioning of School and Road Funds, Bond and Redemp tion Interest all Classes of Engineering Calculations and also for New and Old Bridge Wor Calculations. For further information write:

Marchant Calculating Machine Company

EMERYVILLE Fourth Street OAKLAND, CAL

vided into two chambers, so that when one is undergoing cleaning or repairs the other may be used. The mixing chamber is also divided into two chambers, so that one half may be used while the other is being cleaned or repaired. The outside of the settling basin is of the buttress type reinforced, but with the excavated earth filled to the top of the basins.

FILTERS EQUIPPED FOR BOTH AIR AND WATER WASH

The filters, which were furnished and installed by the Pittsburg Filter Mfg. Co., are arranged in eight units, four on each side of the main filter floor, partially exposed so that the water can be observed. The filter units are of 1,500,000 gallons capacity each. Cleaning is accomplished thru the use of air and water, and all valves used for cleaning and controlling are electrically operated. The operating tables are of marble construction, and the loss-of-head gauges, sampling devices and clock are nickel-plated. The loss-of-head gauges are of the recording type, which both indicates and records the loss of head consumed in the operation of the filter and indicates when the filter requires washing. Each loss-of-head gauge is equipped with three indicating pointers, the first indicating the water level in the filter, the second the wash water pressure, and the third the loss of head in the filter. The recording chart is rectilinear, graduated horizontally in hours and vertically in feet, and so arranged that each will give one day's record. The rate of filtration in each filter is regulated by an outlet controller in the effluent pipe. By means of a graduated hand-wheel located on the operating floor, the rate controllers may be set to give any desired rate of filtration between the limits of zero and 2,000,000 gallons per day for each filter.

FILTER OPERATING FLOOR OF THE GREAT FALLS PLANT

The motor-driven air blower has a capacity of 2,600 cubic feet of free air per minute at four pounds pressure, and is operated by a 50-horse-power squirrel-cage electric motor. The blower is of the Root type and has a capacity and pressure sufficient to give a uniform agitation of sand by the air.

DUSTLESS ROAD

Kansas City, Missouri
Dec. 15, 1916

The Good Roads Company,
Kansas City, Missouri.

Gentlemen:—
The above is a photograph of our street flusher purchased of your company, showing same in operation on the streets of Kansas City.
I want to congratulate you on the construction of this machine and the elimination of pumps in it's operations. It does more work with less water than any other machine I have seen.
In my opinion it represents the last word in street flushing.

Yours truly,
(Signed) FRED A. RICHARDSON,
Supt. of Streets

The dust and mud nuisance of cities and town
be easily and economically eliminated by app
oil to the roads through the Worley-Logan Ato
ing Road Oiler. It distributes the oil over
surface evenly at just the right temperature.

The beauty of this machine is that it can be
for three other important purposes without ch
ing a single part.

First, it can be used as a tar and asphalt sp
er, and as such, gives perfect satisfaction be
it contains a patented steam heater which m
it impossible to burn or scorch the materials
heated. It is also easily cleaned and simp
operate.

Second, it is an excellent and economical s
sprinkler and power flusher. We have en
eliminated the trouble-making parts.

Third, it can be used as a tractor, becaus
towing capacity is sufficient to pull all kin
ordinary road grading and road rolling mach
—thus making it a valuable asset in road-buil

Read what one street superintendent has t
and then write for interesting book "The Du
Road."

THE GOOD ROADS COMPA
14th & Chestnut Sts., Kansas City, Mo

A 24-inch Venturi meter records the rate of flow in gallons per day, with a chart recorder giving an unbroken autographic record of the rate of flow from hour to hour, and a counter-dial showing the total gallons of water that have passed thru the meter. These features, while not absolutely essential, are considered desirable for an efficient and intelligent operation of any modern water-works plant.

Beneath the filter house is the clear water reservoir, also of reinforced concrete construction. This has a depth of 9 feet, and the water flows from this clear water reservoir by gravity to the suction of the high-duty pumps. The location of the plant on a side hill gives 12 feet head to the suction of the high-duty pumps. All the piping from the pump station to the purification plant passes thru a 6 feet by 8 feet reinforced concrete tunnel under the Great Northern Railroad tracks.

Thirty-Day Bacterial Tests

In the tests which were conducted for about thirty days the filtered water was clear and sparkling and free from suspended matter, odors, turbidity and discoloration. In these tests the bacterial efficiency for each filter was as follows:

	Bacteria Per Cubic Centimeter
Raw water from river	1,480
Water in settling basins	910
Water from Filter No. 1	8
Water from Filter No. 2	14
Water from Filter No. 3	6
Water from Filter No. 4	6
Water from Filter No. 5	4
Water from Filter No. 6	8
Water from Filter No. 7	2
Water from Filter No. 8	8
Average of the 8 filters	7

Efficiency of filters, or average bacteria removal from water, 99.52 per cent.

Efficiency of settling basins, or bacterial removal from settling basins alone, 38.5 per cent.

No liquid chlorine was used in these tests.

In Filter No. 2, which shows 14 bacteria per cubic centimeter, the sample was collected immediately after washing.

The plant is provided with liquid chlorine equipment as an adjunct to, but not as a substitute for, filtration.

One noticeable result of the operation of the plant is the decline in the sale of bottled water, for analyses have shown that the municipal supply is far superior to most of the bottled, including spring and distilled, waters on the market.

Water Rates

Great Falls, like many western and northwestern cities, has used water at flat rates, but with the installation of the purification plant it is realized that it is poor business policy to filter water for irrigating use for parks, lawns and war gardens; therefore the officials are taking the preliminary steps toward placing all water users on a meter basis. The water consumption at Great Falls at the present time is reported to be highest of any city in the United States, being approximately 400 gallons per capita per day. The use of meters was not considered while raw and highly turbid water was being used, but now, with a clear, sparkling water, no objection can be urged against the use of meters.

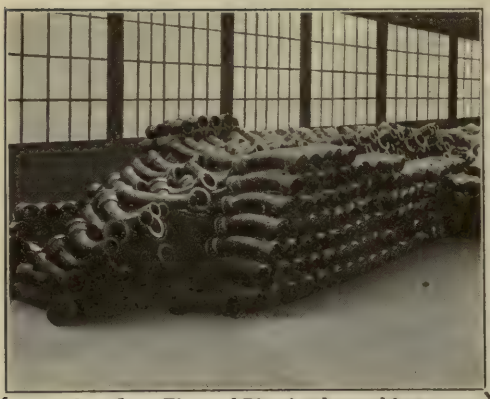
With the installation of meters it is believed that the present water purifying and softening plant is sufficient to take care of a population of approximately 100,000.

Further Construction and Improvements

The entire grounds, of about ten acres, surrounding the filtration plant are being beautified by the Park Board by building roads, paths, lawns and shrubbery, as well as with ornamental lighting, in the belief that efforts to supply good, clear, pure water should be supplemented by making the building and grounds equally clean and attractive.

A new 48-inch flow line to the suction of the pumps is now being installed, and other improvements in reinforcing the distribution system are in progress. The entire distribution system in the city is of cast iron and consists of about 45 miles of pipe. The water is delivered into the mains under direct pressure by five motor-driven high-service centrifugal pumps.

The above work was let by competitive bidding and was subdivided into three sections. The total cost, including engineering, real estate and incidentals, was approximately $225,000.



Cast Iron Flanged Pipe in the making

Cast Iron Flanged Pipe and Fittings

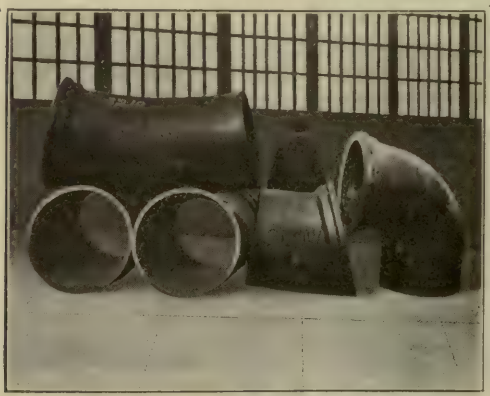
Carried in stock and made special

Let us quote on your requirements

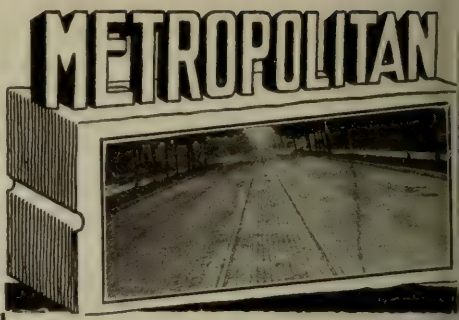
JAMES B. CLOW & SONS
Established 1876
534-546 So. Franklin Street, CHICAGO

Sales Offices
New York, Detroit, St. Louis, San Francisco
Minneapolis, Milwaukee, Denver, Los Angeles

Works
Chicago, Coshocton and Newcomerstown, Ohio



Cast Iron Flanged Fittings in the making



METROPOLITAN BRICK

IN DECATUR, IND.

This street in Decatur, Ind., was paved with Metropolitan Brick in 1894—twenty-four years ago—nearly a quarter century of service and still in splendid condition. This street is no exception—because where ever Metropolitan Brick is used you will find a quality pavement—a dependable pavement.

METROPOLITAN

pavements are noted for their unusual long-life—ease of traction—and appearance.

Are you using Metropolitan Brick in your city—you know, its better to use it than to *wish* you had.

Get our free book "Shale Bed to Road Bed." It tells you WHY Metropolitan is THE brick.

Metropolitan Paving Brick Co.
Canton, Ohio

"The Best Paving Block Made"

Municipal and Civic Publications

WHIPPLE, GEORGE CHANDLER, Professor of Sanitary Engineering in Harvard University and the Massachusetts Institute of Technology; Member of the Public Health Council of the Massachusetts State Department of Health.

State Sanitation: A Review of the Work of the Massachusetts State Board of Health. Vol. II. 1917. viii + 452 pp. Portrait frontispiece, diagrams, tables and figures. **$2.50**

The second volume of a great contribution to the literature on health work in the United States. "A volume of valuable reprints from the Reports of the Massachusetts State Board of Health relating to preventive medicine, public health, intemperance, infantile paralysis, and food inspection, etc., and laying special emphasis upon water supply and sewage disposal." The reports which are included in this volume are specially selected by Professor Whipple from among the many invaluable productions of the old Massachusetts Board of Health. Those who have been vitally interested in this work and who have tried to secure copies of old reports of the Board will appreciate this volume of reprints. Municipal and state health officials, students of public health, and civic and municipal officials in general who would inform themselves of the work of some of the greatest sanitarians of this country will be deeply gratified at having purchased this second volume of "State Sanitation."

BENNION, MILTON, Dean of the School of Education, University of Utah.

Citizenship. An Introduction to Social Ethics. (Introduction by David Snedden.) 1917. xx + 181 pp. **$1.00**

The purpose of this book is to stimulate appreciation of ethical principles and the development of worthy social ideals, and to indicate how these ideals may find expression. Part I emphasizes the nature of society and social problems; Part II stresses the social obligations of the individual and the opportunities society offers each one for development thru service. The book is planned as a text for use in the senior year of the high school or in the first year of college. Some of the subjects treated in the different chapters are: meaning and benefits of civilization; our scientific, literary and political inheritance; social institutions; solidarity of the race; conservation of natural resources and human life; public ownership and regulation; basis of private property; principles of taxation; nature of justice; relation of the individual to social institutions; the family; vocations; business organizations; the school community; coöperative activities; county government; problems of the city; the suffrage; international relations, etc.

KINNEY, J. P., LL.B., M.F., Chief Supervisor of Forests, United States Indian Service.

The Development of Forest Law in America. 1917. xviii + 254. xxi pp. **$2.65**

This contribution to the literature of forestry comprises a historical presentation of the successive enactments by the legislatures of the forty-eight states and by the Federal Congress directed to the conservation and administration of forest resources. The author has endeavored to confine his work to "a logical presentation of the chronological development of legislation that was directed to the preservation of existing forest resources, the reforestation of cut-over or burned-over areas, the extension of forest areas and the systematic management of forests for productive purposes." He states further: "In doing this it has seemed advisable, for the sake of completeness, to include references to a number of laws regarding forest fires, shade trees and other related subjects that were not really forest conservation or forest administration laws." A twenty-one page index completes the volume.

HAZEN, ALLAN, S. B., Member, Am. Soc. C. E., Boston Soc. C. E., Am. W. W. Assoc., N. E. W. W. Assoc., etc.

Meter Rates for Water Works. v–217 pp. Tables and diagrams. 1918. **$2.25**

A critical review of the history of meters, the meter business and the problem of the proper distribution of the costs of supporting a water-works installation. Relatively short, meaty chapters deal with the forms of meter rates now in use, a graphical comparison of meter rates, the use of the minimum rate for revenue, and the service charge for the privilege of having a service without the actual use of any water. The minimum rate based on frontage is taken up in one chapter, followed by another comparing the service charge, the minimum rate, the uniform rate and the alternate procedure suggested by the committee of the New England Water Works Association, of which the author was a member. The sad element in water-works practice, "water unaccounted for," is thoroly discussed, followed by a short compilation from other authorities on leakage from street mains. Mr. Hazen has a short chapter on the under-registration of meters. The remaining chapters deal with the sliding scale, the three-charge rate, the making of a rate schedule and methods of fixing meter rates for a system not yet metered. The book fills a great need in water-works literature. The careful delineation of the many phases of the problem will be of great assistance to municipal officials who are seeking its solution in their cities.

RAY, P. ORMAN, Professor of Political Science, Northwestern University.

An Introduction to Political Parties and Practical Politics. 1917. xii + 628 pp. **$1.60**

This book is adapted for use as a textbook in college classes or as a manual of information which civic community workers can turn to as a handy reference guide. Professor Ray points out that one of the most hopeful signs in American politics is the increasing prominence accorded the study of political parties and practical politics in college and university classrooms, and the book was written with the idea of furthering this tendency. The volume is divided into four parts dealing respectively with present-day national parties; nominating methods; campaigns and elections, and the party in power. Of special interest to readers of THE AMERICAN CITY will be the section under Part II dealing with nominations for local and county offices; the sections under Part III, treating of party machinery, local committees, women voters' organizations, campaign methods, party finance, suffrage qualifications, election laws; also the sections under Part IV devoted to the spoils system, civil service reform, machines and bosses, responsibility of public officers, reference libraries, voters' leagues, etc. The book contains many valuable reference lists at the ends of its chapters, and questions and topics which should prove a help to the teacher.

O'BRIEN, CHARLES.

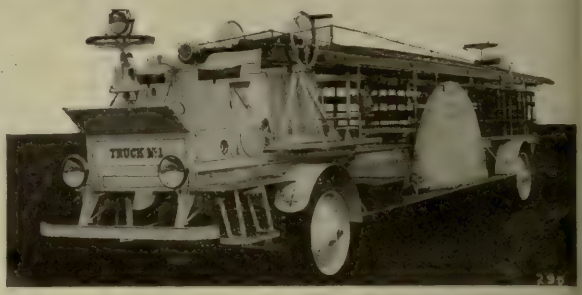
Food Preparedness for the United States. 1917. 132 pp. **75 cents**

This timely book, written with particular reference to war-time conservation of the nation's food supply, is based upon a study of the experience of Germany since the commencement of the war, in the course of which the author has spent much time in that country analyzing its food policy and methods. The book points out some of the factors involved and the lessons to be learned from the experiences of the European belligerents, particularly Germany, where food control has been most highly developed.

Aerial Ladder Truck

The apparatus is of the latest and most approved design and embodies the best practice in Motor Fire Apparatus Construction; particular attention being given to strength, balance and bracing, to stand the service strain of municipal service.
Aerial Ladders, Air-hoists and tractors for steamers.

Write for free booklet



COUPLE-GEAR FREIGHT-WHEEL CO., Grand Rapids, Mich.

Every Town Should Have a Playground—

Yes, every town ought to have at least one playground, or rather "happyland" as the kids call it. It's a great investment and it pays big dividends, in the shape of healthy, happy youngsters—and these kind are priceless.

Get in touch with us! We'll show you how to plan and equip a model playground—*it's our business.*

Write for free illustrated catalog.

HOWARD GEORGE — ***The Playground Outfitter*** **Philadelphia, Penna.**

BOWSER

Oil *and* Gasoline Storage Systems

The next time you purchase gasoline—or when passing the most popular garage in your city—make note that the Gasoline Storage System is the Bowser. You'll find it the case nine times out of ten.

Of course, there's a reason. Garage owners know the Bowser not only protects *their* property and business but *yours*, also.

The Bowser System stores gasoline underground, where it is protected from fire and explosion, and retains its full power.

Write for interesting literature.

S. F. Bowser & Co., Inc. Fort Wayne, Ind., U.S.A.
Sales Offices In All Centers — Representatives Everywhere

Pamphlets and Papers of Civic Interest

See also the department of News and Ideas for Commercial and Civic Organizations

Public Health Administration in Russia in 1917.

A description of the system of free medical aid and health protection for the rural population of Russia thru the agency of the zemstvos, or local representative assemblies. Printed in *Public Health Reports* for December 28, 1917. 29 pp. (Apply to U. S. Public Health Service, Washington, D. C.)

Russia—An Opportunity for Engineers.

The work of the Red Cross Mission to Russia and its relation to the sanitary and medical condition of the country. The work of the United States in aiding Russia to regain her poise. Reprinted from the *Journal of the Boston Society of Civil Engineers,* Vol. 4, No. 10, December, 1917. 28 pp. (Apply to Prof. G. C. Whipple, Harvard University, Cambridge, Mass.)

New Highway Bulletin.

North Dakota Highway Bulletin, Official Publication of the State Highway Commission, Bismarck, N. D. Dedicated to the people of North Dakota interested in better roads everywhere for everybody. A fine start and a welcome addition to good roads literature. (Copies may be secured by writing to the State Highway Commission, attention of the Editor of the *Bulletin.*)

An Approved List of Motion Pictures.

A Garden of American Motion Pictures for Father, Mother and the Young People, Produced Between April 1, 1917, and October 1, 1917. Compiled by the National Committee for Better Films, a Committee of the National Board of Review of Motion Pictures. (Fifth and Sixth Quarterly Catalogues, October, 1917.) 18 pp. (Apply to Mr. Herbert F. Sherwood, 70 Fifth Avenue, New York City.) 10 cents.

Salary Standardization in Akron.

Report on Standardization of Salaries and Grades for the City of Akron, with Recommendations. Prepared by the Akron Bureau of Municipal Research and Submitted to the Finance Committee of the Common Council, November 12, 1917. 72 pp. Typewritten. (Apply to Don C. Sowers, Director, Bureau of Municipal Research, Akron, Ohio.)

Child Legislation in Minnesota.

A Compilation of the Laws of Minnesota Relating to Children. By William W. Hodson, Director, Children's Bureau, State Board of Control, St. Paul, Minn. 1917. 185 pp. (Apply to author, as above.)

Publicity for the Public Schools.

The Board of Education of Kane, Pa., has decided upon the publication of a series of pamphlets, each one to give definite and non-partisan information concerning some phase of school work. THE AMERICAN CITY has received Nos. 1 and 2 in this series, entitled: "Estimates or Positivism. Which?" (April, 1917. 15 pp.), and "The Child. Where Is He?" (October, 1917. 8 pp.) Statistics for the school year ending June 30, 1917, are given in "Child Accounting for the Schools of Kane, Pa.," also received. (8 pp.) (For copies of this literature apply to H. O. Dietrich, Superintendent, Board of Education, Kane, Pa.)

Connecticut State Parks

Report of the State Park Commission to the Governor for the Two Fiscal Years Ended September 30, 1916. State of Connecticut, Public Document No. 60. 1916. 32 pp. (Apply to the Commission, Hartford, Conn.)

Publicity for Parks.

The American Association of Park Superintendents has recently commenced the publication of an official journal to be devoted to the dissemination of knowledge, theoretical and practical, relating to the improvement and maintenance of parks and recreation facilities, entitled *Parks and Recreation.* Quarterly. (Vol. I, No. 1, October, 1917.) The first issue comprises 84 pages of interesting articles and good illustrations. (For information apply to Roland W. Cotterill, Managing Editor, *Parks and Recreation,* Seattle, Wash.) Subscriptions $1.00 per year; single copies 25 cents.

Public Ownership in Los Angeles.

Report on Government Ownership of Public Utility Service Undertakings. Prepared by the Committee on Municipal Ownership of the City Club of Los Angeles. September 15, 1917. 38 pp. (Apply to the Club, Los Angeles, Cal.) 10 cents.

A Housing Manual.

The Commission of Immigration and Housing of California has issued a State Housing Manual containing the State Tenement House Act, State Hotel and Lodging House Act and the State Dwelling House Act, with annotations. 1917. Diagrams. 118 pp. (Apply to Paul Scharrenberg, Secretary to the Commission, Underwood Building, San Francisco, Cal.)

The Problem of the Dirty Tenant.

"Slums" and "Slummer": The Problem of the "Dirty Tenant." (Letters and articles which appeared in *Municipal Engineering and The Sanitary Record,* London, August-October, 1916, reprinted by request. 15 pp. (Apply to The Sanitary Publishing Company, Ltd., 8 Breams Buildings, London, E. C. 4.) 8 cents.

Chicago's Municipal Tuberculosis Sanitarium.

Annual Report, City of Chicago, Municipal Tuberculosis Sanitarium, 1916. 1917. Photographs, diagrams, tables. 98 pp. (Apply to the Sanitarium, Chicago, Ill.)

Pumping Station Cost and Efficiency Records.

A scheme of recording the cost and efficiency records of the various pumping stations in the Brooklyn, N. Y., district, by which the time when each should be taken out of service is estimated. Reprinted from the Journal of the American Water Works Association, Vol. 4, No. 3, September, 1917. 7 pp. (Apply to the author, Mark Wolff, 1328 Broadway, New York City.)

1917 Report of the Canadian Commission of Conservation.

A remarkable report of the re-examination of the resources of the Dominion of Canada brought about by the war. Covers soils, forestry, classification of Crown lands, town planning and development, conservation of food sources, fur resources, the prevalence of venereal diseases, water powers and industrial development, and the mineral industries. (Apply to Clifford Sifton, Esq., Chairman, Commission of Conservation, Ottawa, Canada.

New York City's Water Meter Specifications.

The Specifications for Water Meters listed on page 87 of THE AMERICAN CITY for January, as issued by the Bureau of Water Supply of the Department of Water Supply, Gas and Electricity of the City of New York, is only a preliminary draft and is not available on application.

Winning Wars With Miles and Minutes!

We must produce more!

But one product is dependent upon another. Consequently we must keep the lines of communication clear—link our industries closer together.

It all reverts to one solution and one alone. That is *better roads* providing a great outlet in quickening transportation with the aid the of open road and the motor truck.

Time is everything and better roads mean more miles in fewer minutes.

Knit this country together with these pulsing arteries of progress and success is ours in peace and war.

Garford MOTOR TRUCKS

The Garford Motor Truck Company, Lima, Ohio

Manufacturers of Motor Trucks of 1, 1½, 2, 3½, 5 and 6 ton capacity. 4½, 7 and 10 ton Tractors

The Garford Road Builder

Methods, Materials and Appliances

News from Engineers, Manufacturers and Supply Houses

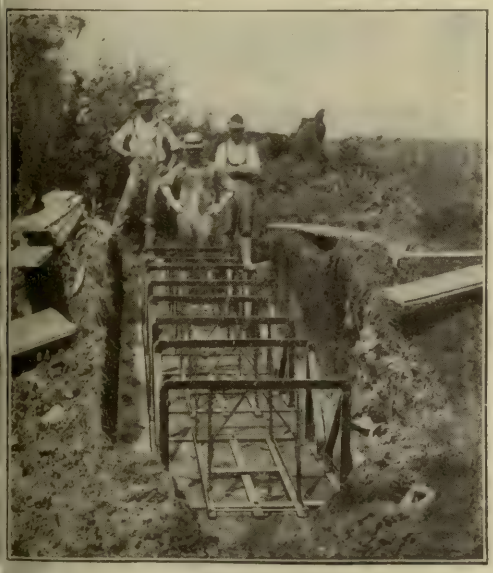
Better Culverts for Less Money

The photographs here reproduced show a culvert form which is doing much to place concrete culvert construction on a more economical and efficient basis than has heretofore been attained. It is made by the Storms Manufacturing Company, Monadnock Building, Chicago, Ill., and comes in two sizes, adjustable laterally and perpendicularly to construct thirty-nine different sizes of culvert. Four independent forms constitute a complete set sufficient for a 30-foot culvert. One man can handle them without difficulty.

Contrast culvert construction by means of these forms with the old method. In addition to the labor necessary to saw, fit and nail up the wooden frame-work used in the old method, there is the oft-repeated cost of the lumber for the frame-work, which frequently becomes wedged so tightly that it is destroyed in being removed. The time required for the erection of wooden frames also counts heavily against their value, since it adds greatly to the cost of construction.

On the other hand, the "one-man" collapsible form can be set up in place in a few moments, the boards set around it, the concrete poured, and the job is done. When the concrete has hardened, a pull on the cross-rod at the bottom of the form, which the larger illustration shows set up ready for work, collapses the cross-arms at the top, and so pulls the side uprights in toward each other. When this support is withdrawn, the boards drop away from the concrete intact and clean, and ready for the next job.

36 x 46-INCH CONCRETE CULVERT, CRAWFORDSVILLE, IND.



ONE-MAN CULVERT FORM IN OPERATION

The forms are guaranteed to support a 2-foot thickness of concrete the entire length of the culvert without sagging, which makes it perfectly safe to fill over the concrete before it is set to accommodate traffic.

The smaller illustration will give an idea of the results achieved by the use of these forms. A pamphlet of unusual interest entitled "One-Man Collapsible Culvert Form," which has been issued by the Storms Company, discusses this product in full, and reproduces many appreciative letters from contractors and engineers testifying to its practical worth.

How to Meet the 50,000,000-Ton Coal Shortage

Our country has always been very wasteful of one of our greatest natural resources, namely—coal.

During the war the Government is doing its best to arouse people generally to save all possible of this important commodity. Reports and warnings from different Government bureaus in relation to the national shortage are of almost daily occurrence. Many means of reducing this shortage have been suggested by the Government. Perhaps the most practical of these, and one that not only saves coal for the country but is also a big saver for the owner, is a producer gas engine.

The United States "Nobby Cord" Pneumatic Truck Tire

New Tire Factor Enters Field of Motor Trucks

Today it is a fact that many motor trucks if equipped with United States "Nobby" Cord Pneumatic Truck Tires can be operated at a greatly increased speed and with greatly reduced expense.

Some trucks can't use these "Nobby" Cord Pneumatic Truck Tires—but many can—can yours?

If yours can, you can save money on gasoline, oil and truck upkeep.

If yours can't, you can rely on the phenominal mileage records that have been made, and are being made, by United States Solid Truck Tires.

See the nearest United States Truck Tire Dealer or the nearest United States Tire Service Branch. The truck tire expert will tell you. If there is no dealer near you, write us, sending make of your truck and the capacity.

United States Tire Company

1790 Broadway, New York

THE GAMEWELL FIRE ALAR TELEGRAPH CO.

"Registered U. S. Patent Office"

Manufacturers of Fire Alarm and Police Signal TELEGRAPHS for Municipalities and Private Parties

The Gamewell system of to-day is the outcome of the combined inventive genius and mechanical skill of many whose valuable services the company has been able to secure during the past fifty-seven years, in pursuance of its policy of meeting at any cost the requirements of the varied conditions existing in different localities.

Correspondence Solicited.

General Office and Works:
Newton Upper Falls, Mass.

Have You Brains?

What are they worth to you?

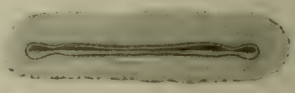
"What is the service worth" is the basi for all values.

SERVICE

is **all** that is bought or sold. This is wh two loaves of bread same size are wort more than one. Why a R. R. ticket fror New York to Chicago is worth more tha one to Buffalo.

Additional Service

This is why B-Lateral Fire Hose is wort more than DOUBLE that of the old cor struction, because Bi-Lateral Hose can b flattened without injury to the rubbe lining.



Why not buy fire hose constructed right? When in the market write us,

BI-LATERAL FIRE HOSE COMPAN
326 W. Madison Street, Chicago, Ill.

Such a plant uses about one-eighth of the coal usually consumed by the average steam plant. These plants make gas direct from coal and use the gas in a gas engine.

The producer itself is very similar to a large base burner, and the engine is in general principle not unlike the automobile engine, only, of course, of heavier construction and much larger.

These plants have been in very general use in European countries, where the price of coal has always been much higher than here. With our present high costs and the possibility that coal will never again be cheap, it behooves every factory to install some fuel-saving device, not only for national conservation purposes but for his own saving.

In this connection, the Bruce-Macbeth Engine Company, 2137 Center Street, N. W., Cleveland, Ohio, has prepared an information blank on a post card form, to be filled in by coal consumers, with a view to determining the comparative saving which would be effected by the installation of a producer gas engine power plant of the type which this company manufactures. In view of the severity of the coal shortage, public utilities and other large users of coal should overlook no opportunity for increasing efficiency and economy in their power plants.

New York Sales Rooms for Pruden Company

The C. D. Pruden Company, manufacturers of "Prudential" portable galvanized steel buildings, underwriters' hollow metal windows, Kalamein doors and windows, with main office and factory at Baltimore, Md., opened a general sales office on December 1, 1917, for their products in rooms 806-807 Wallace Building, 56-58 Pine Street, New York City. The office is in charge of Leigh Pruden, vice-president of the company.

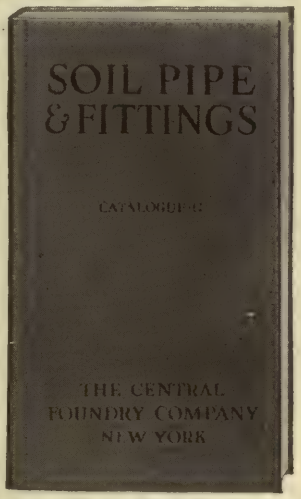
A Department to Increase Efficiency in Park Administration

Many boards of park commissioners and park committees are coming to realize the real necessity for expert technical advice in the management of parks and other public properties in order to make the best and most economical use of the resources at their command. In recognition of this fact, Benjamin E. Gage, Landscape Advisor, 30 N. LaSalle Street, Chicago, Ill., has inaugurated a Park Management Department.

The purpose of this department is either to assume the active management of parks and other properties, or to act in an advisory capacity to the department having charge of them. It "steps in between the board and the laborers, making all arrangements for help, supplies, etc., and makes reports and recommendations to the board." It aims, by introducing into park maintenance and development the most up-to-date and efficient business methods to greatly reduce the cost of operation while obtaining better results. The Park Management Department has already done effective work in reorganizing park administration methods in communities, and solicits investigation by interested parties.

The Central Foundry Company Catalogue

The Central Foundry Company, 90 West Street, New York City, has just issued a new catalogue known as Catalogue "G." This presents, in addition to the regular line of soil pipe and fittings manufactured by the Central Foundry Company, other specialties widely used for cast iron house drainage. Since uniform specifications governing standardized weights and dimensions of soil pipe fittings are now called for by many city and state plumbing



codes, the cuts illustrating Catalogue "G" are of these modern designs in soil pipe fittings. The cuts used as illustrations of pipe and fittings are from actual photographic reproductions of the material now furnished from the seven large foundries of the company, where the well-known "F & W" line and the "Universal" cast iron pipe are also made. Many familiar as well as new lines of cast iron special fittings and traps are also seen in this catalogue, notably the "R-T" closet bend; cast iron drum traps; the Central Foundry Test Tee (something entirely new to the trade); the Lynn drain trap; the Universal boiler stand; cast iron cesspools; service and stop cock boxes; roadway boxes, etc. Catalogue "G" may be secured upon request by those addressing a line to the general offices of the Central Foundry Company, 90 West Street, New York City.

An Effective War Measure Sign

In the U. S. Government Explosives Act, recently passed by Congress, specific provision is made that "every person authorized under this Act to manufacture or store explosives or ingredients, shall clearly mark and define the premises on which his plant or magazine may be, and shall conspicuously display thereon the words, 'Explosives—Keep Off.'"

DUPLEX

4-WHEEL DRIVE TRUCK

The Duplex has the strength, the irresistible power and endurance to perform efficiently the most severe haulage tasks.

Let us send you our catalog and the heavy haulers magazine, "Duplex Doings." Address all communications to Dept. 136.

DUPLEX TRUCK COMPANY
Lansing, Michigan

Dayton Airless Fire Equipment Tires

are safe and easy-riding at any

SPEED

They are always reliable and long service makes them economical. That's why they dominate the field in motorized fire equipment.

Write for booklet.

The Dayton Rubber Mfg. Co.
DAYTON, O., U. S. A.

The Anderson Coupling & Fire Supply Company

KANSAS CITY, KANSAS

Manufacturers of

MOTOR FIRE APPARATUS

General Fire Department Supplies

Anderson-Hale Fire Station Door Openers

Estimates Cheerfully Given

Loper Fire Alarm Co.

STONINGTON, CONN.

Manufacturers of

Compressed Air Fire Whistles

Whistle Blowers

Bell Strikers, Boxes, Gongs

Etc., Etc.

Estimates Cheerfully Given

A Fire Hose

of unusually careful manufacture

Wax and Para Gum Treated

The lining is of fine Para Gum, hand made, four calendered, smooth bore or lap-jointed.

Circular balance woven, each strand of cotton is treated to a bath of melted Wax and Para Gum, then cabled and woven into the jackets

Absolutely waterproof, making the ideal hose for fire departments.

Treatment lubricates and solidifies the strands of cotton, assuring long wear.

Made in all sizes from 1 to 6 inches inside diameter

Fabric Fire Hose Co.
Corner Doane and Church Streets New York

BRANCH OFFICES:

CHICAGO	ELMIRA, N. Y.
ATLANTA	BINGHAMTON, N. Y.
COLUMBUS, O.	PITTSBURGH
MINNEAPOLIS	NEWARK, N. J.
OKLAHOMA CITY	MONTREAL
PORTLAND, ORE	PROVIDENCE
SAN FRANCISCO	DALLAS, TEX.

BALTIMORE, MD.

Patentee and Sole Manufacturer

When this law became effective the Stonehouse Steel Sign Company, Seventeenth and Lawrence Streets, Denver, Col., submitted the

sign here illustrated to the attention of Francis S. Peabody, Assistant to the Director in charge of Explosives, and he approved it. The sign is made of 30- and 18-gauge steel in two sizes, 10 x 14 inches and 14 x 20 inches. The color scheme is red, white and black, in porcelain enamel.

A large, illustrated color circular, entitled "War Measure Sign," has been issued by the company. It describes this and other danger signs which are of interest and importance to manufacturers of explosives. Prices, singly and in quantities, are furnished. Attention is also called to the company's descriptive matter covering signs and tags for every conceivable safety warning.

New President for Worthington Pump Corporation

At a meeting of the Board of Directors of the Worthington Pump & Machinery Corporation, 115 Broadway, New York City, held December 31, 1917, C. P. Coleman was elected president of the corporation.

Quick Concrete Mixing

The "Mix-a-Minute" line of concrete mixers made by The Jaeger Machine Company, 215 West Rich Street, Columbus, Ohio, is illustrated and described in condensed form in a snappy folder. "The Jaeger Way Is the Speed Way" is the theme of this circular, and the conical tilting drum is featured as being the most practical type of mixing drum—working quickly, thoroly and staying clean; having one center bearing and an even balance; taking little power and quickly discharged by simply turning over, and emptying all or part of the batch at once. There are many Jaeger ways of mounting this mixing drum. Ten different outfits are displayed in the folder, each with illustration and specifications. They are: with loader; without loader; with hoist; with loader and hoist; grouting outfit; big mixer; paver mixer; "regular" mixer with loader mounted on crosswise trucks and equipped with spout, and the mixer on skids. The accompanying illustration shows a Jaeger mixer at work on a sidewalk job, which is of especial interest in view of the fact that municipalities all over the country are doing a great deal of their own sidewalk work.

BUILDING CONCRETE SIDEWALKS WITH A JAEGER MIXER

Oklahoma Road Improvements

A significant step in the furtherance of the good roads cause was taken when the Board of Commissioners of Okmulgee County, Oklahoma, voted an $800,000 serial road bond issue for the improvement of the roads of this county. Upon the advice of a well-known firm of consulting engineers, it was decided to use Warrenite in the improvement of the 52 miles of road which were to be benefited by the appropriation. The construction will be carried on by a western paving company under the patents and expert laboratory supervision of the Warren Brothers Company, Boston, Mass.

Pioneer Asphalt Company Now at Chicago

The Pioneer Asphalt Company announces that after February 1, 1918, its general offices will be located at 7323 Woodlawn Avenue, Chicago, Ill. It will continue to produce a full line of bituminous and asphalt products.

William D. Uhler in U. S. Army

William D. Uhler, Chief Engineer of the Pennsylvania State Highway Department, and president of the American Association of State Highway Officials, has been commissioned a major in the Transportation Division of the United States Army. However, in his new post Major Uhler will, as far as possible, keep in touch with the work of his own State Highway Department.

How Much Gasoline Do Your Trucks Use?

With the popularization of motor apparatus for municipal departments, the stable has given

Expert Advice and Service *for* Park Departments!

OWING to the increasing demand for technical and expert advice in park matters, and the desire on the part of many Boards of Park Commissioners and Park Committees to turn over the parks to skilled persons to manage, we have inaugurated a Park Management Department. We manage your properties, either in detail or act in an advisory capacity. This is a real service by expert and skilled hands. We will put business methods into park maintenance and development. We will show you how to save money and get increased results.

Write for Detailed Information.

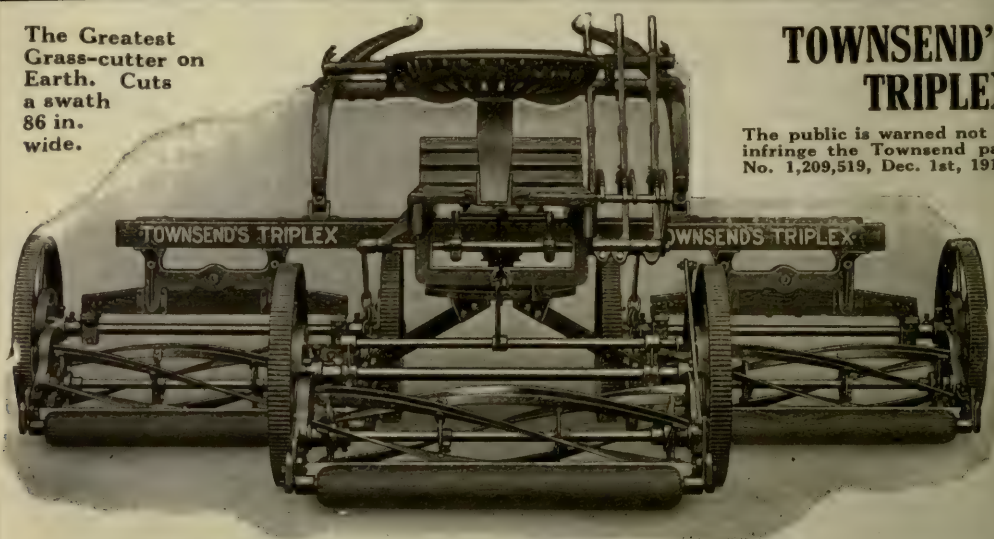
Benjamin E. Gage 30 N. LaSalle St. **Chicago, Ill.**

"AUTHORITY ON PARK MANAGEMENT"

The Greatest Grass-cutter on Earth. Cuts a swath 86 in. wide.

TOWNSEND'S TRIPLEX

The public is warned not to infringe the Townsend pat. No. 1,209,519, Dec. 1st, 1916.



Drawn by one horse and operated by one man, the TRIPLEX MOWER will mow more lawn in a day than the best motor mower ever made, cut it better and at a fraction of the cost.

Drawn by one horse and operated by one man, it will mow more lawn in a day than any three other horse-drawn mowers with three horses and three men. (We guarantee this.)

Floats over the uneven ground as a ship rides the waves. One mower may be climbing a knoll, a second skimming the level, and the third paring a hollow.

Does not smash the grass to earth and plaster it in the mud in springtime, nor crush out its life between hot rollers and hard, hot ground in summer, as does the motor mower.

Write for catalogue illustrating all types of Townsend Lawn Mowers, with list of users (FREE).

S. P. TOWNSEND & COMPANY

23 Central Avenue, Orange, N. J.

A METER FOR MEASURING GASOLINE

way to the municipal garage. Cities have effected considerable savings by buying gasoline in large quantities to supply municipal motor trucks. But much of this saving may be lost if the supply is not metered. The meter is the bookkeeper of the gasoline tank. It eliminates pilfering for personal uses, and it becomes a valuable factor in figuring the operating cost of municipal motor apparatus, showing the consumption of each truck accurately.

The Niagara meter in the illustration is a product of the Buffalo Meter Company, 2917 Main Street, Buffalo, N. Y. It measures gasoline from systems operated by pumps, gravity, air pressure or hydraulic pressure. The dial is vertical, six inches in diameter, with black figures on white. A large hand indicates pints, quarts and gallons from 0 to 10 gallons. A knurled thumb piece projects thru the dial glass so that the hand may be turned back and automatically stopped at 0. A straight reading register, which cannot be set back, counts the total gallons from 1 to 100,000 and repeats.

The Buffalo Meter Company also makes books for recording meter readings. These may be procured in either loose leaf or bound form, pocket size and larger.

✣ ✣

A "Versatile" Tractor

A tractor that is applicable to a wide variety of jobs is the one that should appeal to any municipality desiring to make the most of its motor investments. Such a tractor is that manufactured by the Watson Wagon Company, 30 W. Center Street, Canastota, N. Y. Here it is shown towing a road scraper. Even in this light work it effects a saving over horsepower. But its most effective work is in hauling heavier apparatus, such as dump wagons, trailers, heavy road machinery, etc.

An incident that serves in a way to illustrate the adaptability of this tractor comes from a rural community in the state of Washington. A Watson agent was delivering a new outfit, including a bottom dump semi-trailer, and was passing thru a small community when a fire alarm was turned in. The apparatus was very near to the fire department building at the moment, and the quick-witted driver unhooked from his semi-trailer and backed the tractor into the fire house, hooked on to the hook and ladder truck, which, like most of the equipment, was of the hand-drawn type, and started off in the direction of the fire ahead of any of the other apparatus. While this, of course, would not be practical in a general way, it was the general utility of the tractor that made possible its use in such an emergency. To the small town which cannot afford an extensive outlay for up-to-date motor apparatus for its different departments, the tractor offers the solution to most of its problems.

WATSON TRACTOR TOWING A ROAD SCRAPER

MUNICIPAL SURVEYS

Twelve years successful results in over one hundred city, county and state governments in United States and Canada.

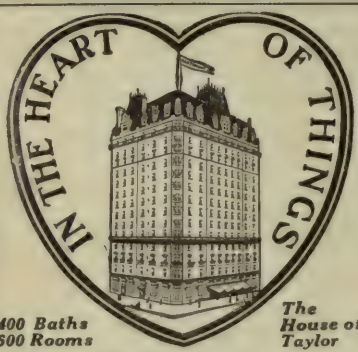
Audits
Charter Drafting
Budget Systems
Accounting
Salary Standardization

Police and Fire
Highways
Health
Institutions
Schools

Refuse Collection and Disposal
Waterworks and Other Public Utilities
Methods of Taxation, Etc.

Write for Literature. Estimates Furnished.

BUREAU OF MUNICIPAL RESEARCH, 261 Broadway, New York City



400 Baths
600 Rooms

The House of Taylor

HOTEL MARTINIQUE

Broadway, 32d St.
NEW YORK, N.Y.

One Block from Pennsylvania Station.

Equally Convenient for Amusements, Shopping or Business

Pleasant Rooms, with Private Bath, **$2.50** per day

257 Excellent Rooms, with Private Bath, facing street, southern exposure, **$3.00** per day

Also Attractive Rooms from $1.50.
The Restaurant Prices Are Most Moderate

—AND NOT ONLY IN LAPEER

but in every city where South Bend Double Duty Apparatus is installed. They perform that same efficient, conscientious service. They are dependable—and that's what counts in Fire Apparatus. Write us for booklets.

City of Lapeer
R. F. FRAY, MAYOR

LAPEER, MICHIGAN. April 6'17

South Bend Motor Car Works
South Bend, Ind.

Attention Messrs.Mecklenburg & Scott.
Gentlemen:
I am writing this letter to let you know that you were about 24 hours early with your Munsey Committee, as last night Lapeer experienced the most disastrous fire ever known in her history.
An alarm was turned in at 6.30P.M. and we put the pumper to work immediately, drawing from the river. She did continuous service for about 8 hours and saved the city of Lapeer at least two valuable stores, amounting to a good many times the price of the entire equipment.

This morning our most radical knockers against the purchase of the machine frankly told me that the machine did not owe the city of Lapeer a cent.

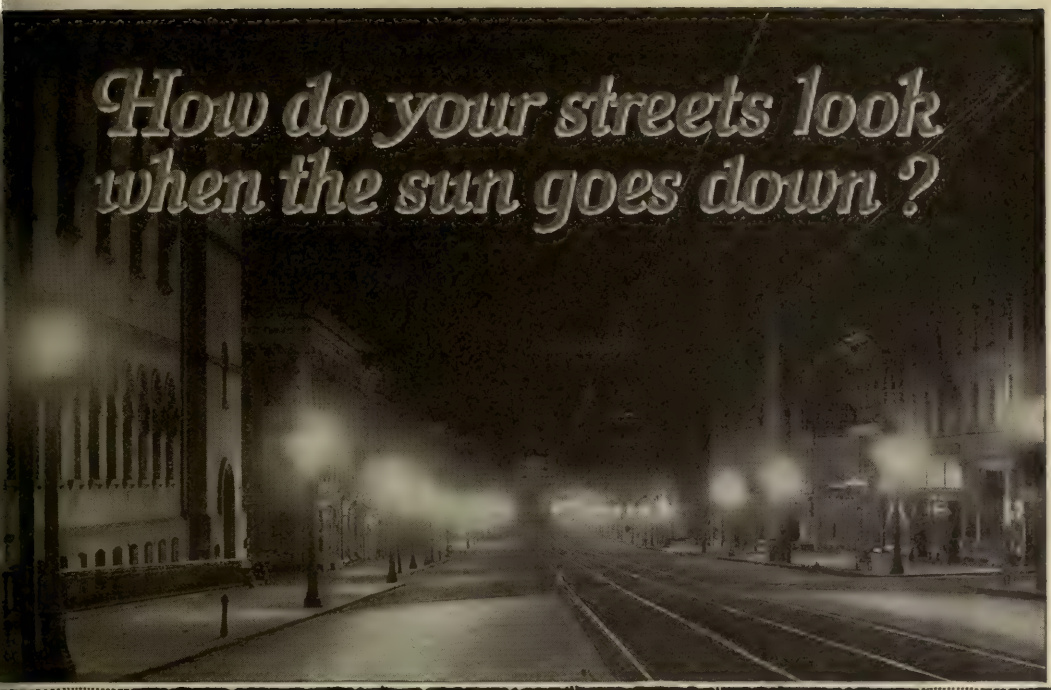
It certainly did admirable and efficient service for 8 hours continuous work.

Very truly yours,

R. F. Fray
Mayor.

RFF/KB

The South Bend Motor Car Works **South Bend, Ind.**



Street-ology

Do they sparkle with white light?

Do they draw people from far and near to go "window shopping?"

Are they an inducement to live and do business in your city?

Do they increase the value of your real estate?

Do they advertise the city?

Do they discourage crime and rowdyism? Do they safeguard traffic and pedestrians?

Are they a credit to your city administration?

Are they a shining example of what a good lighting company can do for a city? Do they cause you to hold up your head in honest pride?

If you live in a G-E Lighted Town, you can give an emphatic "YES" to every question.

If you can't say "yes"—ask the nearest G-E Street Lighting Engineers to help you make those dark highways into bright "*White Ways*."

GENERAL ELECTRIC COMPANY

SCHENECTADY, N. Y. Sales Offices in Principal Cities

7328

Everything for the Playground

PROGRESSIVE CITIES USE

THE FUN-FUL LINE
PLAYGROUND EQUIPMENT

Write for free Booklet

HILL-STANDARD CO.

216 Fun-Ful Ave., Anderson, Ind.

City Planning in Flesh and Blood

If you are interested in planning for the future of your city in terms of better health, less poverty, better education, more wholesome recreation, happier and more contented workers, closer cooperation between public and private welfare agencies;

If you want to keep in touch with the most authentic news and the most authoritative opinion from every field of work for the common welfare;

You will find enjoyable, helpful and inspiring the attractively -printed,graphic ally illustrated and carefully edited weekly issues of **The Survey.**

Send three dollars now in check or greenbacks for a year's subscription—52 issues.

THE SURVEY

JOURNAL OF SOCIAL WORK.

112 East 19 St. **Room 1204** **New York City**

Paul U. Kellogg, Editor.

Edward T. Devine, Graham Taylor, Jane Addams, Associate Editors

ALL MUNICIPALITIES NEED PLAYGROUNDS

The Playground not only betters the physical and moral tone of a city, but it is a real live investment. It cuts the perpetual moving population to a minimum which saves your manufacturer and your merchant.

American Apparatus will produce results.

WRITE FOR OUR CATALOGUE TO-DAY

AMERICAN PLAYGROUND DEVICE CO., W. 25th St., Anderson, Ind.

All Steel Playground Apparatus

THE EUREKA STUDEBAKER PARK COMBINATION

THE EUREKA LINE — STRONG AS THE STRONGEST · SIMPLE AS THE SIMPLEST · THE CHILDRENS FAVORITE

Swings, Giant Strides, Flying and Traveling Rings, Teeter Boards and Ladders, Aluminum and Maple Slides, Park Settees and Lawn Swings, Merry-Go-Rounds, Horizontal Ladders and Combinations.

Cat. No. 16 Full Outfits And Fittings Only

The Ashland Mfg. Company
Dept. 14 Ashland, Ohio

To so form the life of our youth that they need never be reformed is indeed a great achievement

Eureka Equipment Utility Unexcelled Renowned Rectitude Efficient Economical Kiddies Kind All-Steel Apparatus

WHO SAID "BRICKS?"

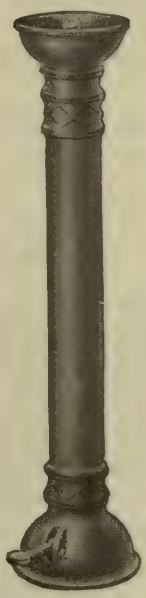
We are in the heart of the first quality shale lands and we are planning to make brick for every conceivable purpose.

We invite correspondence from municipal officials or anybody else seeking information about brick, conduits or building brick.

THE SCHUYLKILL VALLEY VITRIFIED PRODUCTS CO.
Oaks, Montgomery County, Pa.

Inexpensive Drinking FOUNTAINS

OUR bubbling fountains, the practical kind, are just the kind to be installed on your sreets and boulevards, in your parks and squares and public playgrounds. The expense for installation is very small as is the up-keep cost.



We are specialists on fountains for drinking purposes. Place your requirements in our hands. Write for our catalogue showing our many designs.

RUNDLE-SPENCE MFG. CO.

MILWAUKEE, WISCONSIN

FOUNTAINS

DISPLAY and DRINKING

LAMP STANDARDS

OVER ONE THOUSAND PATTERNS

THE CASEY HEDGES CO.

CHATTANOOGA, TENN.

Chicago Cincinnati

ENTERPRISE IRON FENCES

Combine durability and handsome appearance.
They do not obstruct your fine views.
Let us blue-print your fence needs free.

Send for book containing reproductions of the world's finest fences — its free

THE ENTERPRISE IRON WORKS

1123 East 24th Street, Indianapolis, Ind.

***The* WHITE TRUCK BOOK**

250 Pages *1400 Illustrations*

A Graphic Record of Truck Uses in all Lines of Industry and Commerce

Sent gratis to any truck user if request is signed by responsible official

THE WHITE COMPANY

CLEVELAND

Cemcoat

The Enamel-like Wall Coating

Cemcoat is furnished in either Gloss or Flat.
Cemcoat has the combined virtues of enamel and paint.
It presents a tile-like finish.
It is washable, sanitary and durable.
Cemcoat should be used for all municipal buildings such as Schools, Bath Houses, Police Stations, Jails, etc.
Particularly adapted for safety lines on pavements.

Write for literature, color card, testimonials, etc.

Department 27

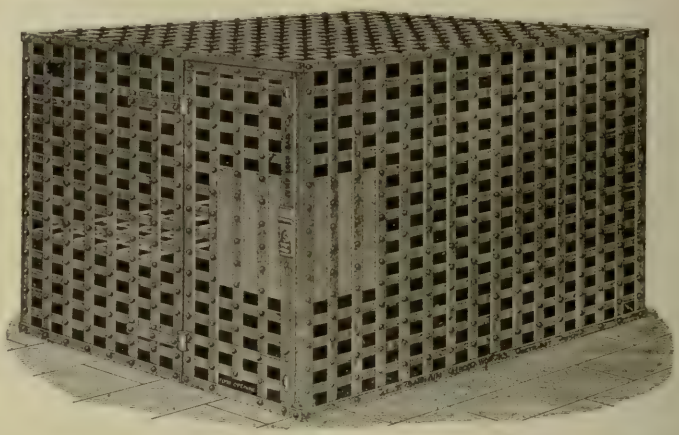
L. SONNEBORN SONS, Inc.
264 Pearl Street, New York

ESTABLISHED 1866

BARNUM JAIL CELLS

JAIL WORK of EVERY DESCRIPTION

Jail Entrance Doors
Steel Lining for Jail Walls
Jail Bedsteads
Steel Window Guards
Iron Stairs



Folding Steel Bunks
Tool-Proof Steel Work
Sanitary Equipment
Locking Devices
Padded Cells

SEND FOR CATALOGUE

E. T. BARNUM IRON WORKS
DETROIT, MICHIGAN

LAPIDOLITH

TRADE MARK

For All Concrete Floors

The concrete floors in your water-works, fire-houses, filtration plants, pump stations, etc. need Lapidolith to make them hard as granite—dustproof, waterproof and resistant to the action of mostc hemicals. Lapidolith should be used on all concrete floors, old or new. Results are guaranteed.

Used by leading industrial plants in every line in every city.

Write for literature, testimonials and free samples.

Department 27

L. SONNEBORN SONS, Inc.

264 Pearl Street, New York

The National Municipal League Series of Books

Edited by Clinton Rogers Woodruff

CITY GOVERNMENT BY COMMISSION. By Clinton Rogers Woodruff. The arguments for and against commission government and a description of the system.

THE CITY MANAGER. By Harry Aubrey Toulmin, Jr. A complete summary of the actual workings of the city manager.

MUNICIPAL FUNCTIONS. By Herman G. James. The standards of accomplishment by which a city government may be measured.

THE REGULATION OF MUNICIPAL UTILITIES. Edited by Clyde Lyndon King. A thorough discussion of the subject, with practical suggestions.

THE INITIATIVE, REFERENDUM AND RECALL. Edited by William Bennett Munro. 14 chapters by 14 prominent statesmen, educators, etc.

EXCESS CONDEMNATION. By R. E. Cushman. The benefit to city and citizens of condemning property adjacent to that actually needed.

CITY PLANNING. Edited by John Nolen. The solution to practically every building or reconstruction problem that confronts a city.

TOWN PLANNING FOR SMALL COMMUNITIES. By Charles S. Bird, Jr. Full of suggestions for those responsible for planning or improving small communities.

SATELLITE CITIES. By Graham Romeyn Taylor. How to plan the social and civic conditions of working people in industrial towns.

THE SOCIAL CENTER. By Edward J. Ward. Using the school-house for community purposes.

LOWER LIVING COSTS IN CITIES. By Clyde Lyndon King. A plan for reducing living costs in cities.

WOMAN'S WORK IN MUNICIPALTIES. By Mary Ritter Beard. An amazing summary of what women have done for their cities.

These books are bound uniformly in green cloth, stamped with gold. Price, $2.00 net per volume; by mail, $2.15. They can be purchased at book-stores or will be sent direct by the publishers. A descriptive booklet will be mailed free upon request.

THESE ARE APPLETON BOOKS

D. APPLETON & COMPANY 35 WEST 32ND STREET NEW YORK

AN IMPORTANT REMINDER

For every Chamber of Commerce Secretary
For Every Man Who Wants to Be One

The American City Bureau Summer School for Chamber of Commerce Secretaries will be held this year during July, as usual.

The school is a thoroughly demonstrated success.

There were 15 students in 1915
57 in 1916
91 last year

There are going to be a good many more this year.

This rapid growth in attendance has been due simply to the fact that the school has been providing for a definite need—that it has been helping a number of men to gain the strength they needed to succeed.

Don't forget to set aside two weeks for this school in your schedule for 1918.

AMERICAN CITY BUREAU SUMMER SCHOOL

Tribune Building
New York

SUBMARINE CABLE

(One Mile 3 Conductor 2 B. & S. for 13,200 V. W. P.)

FOR

ROCKINGHAM COUNTY LIGHT & POWER CO.

PORTSMOUTH, N. H.

SIMPLEX WIRE & CABLE CO

MANUFACTURERS

201 DEVONSHIRE ST. BOSTON

CHICAGO SAN FRANCISCO

STEWART IRON FENCE

"The Standard of the World"

autifies and protects public property onomically, permanently, satisfactorily. e fencing of reservoirs at Chattanooga, Tenn., rt Thomas, Ky., Butte, Mont., and pumping tions at New York City and Seattle, Wash., are pical Stewart installations.

ewart's Iron Fence and Gates for hospitals, schools, rks, playgrounds and public buildings. Write big illustrated catalog.

THE STEWART IRON WORKS CO.

(Incorporated)

7 Stewart Block Cincinnati, O.

"The Spring's the Thing"

SHAWNEE MOWER CO., 5 Beekman St., N. Y.

3c per M square feet

for labor to apply Atlas Chemical Weed-Killer. Permanently eliminates weeds for the entire season.

Diluted with 20 parts water and apply in sprinkling wagon or watering can.

Full particulars and prices furnished on request.

Chipman Chemical Engineering Co.

Incorporated

95 Liberty St. New York

ATLAS WEED-KILLER

Grass and Weed-Killing Chemical

SANITATION

While our "CANCO" garbage can in point of appearance and strength of construction is without a peer, yet our equipment—the most comprehensive in the country—is such that we can make any desired sort of garbage container.

TRADE CANCO MARK

AMERICAN CAN COMPANY

NEW YORK

Chicago Toledo San Francisco

With Offices in All Large Cities

REFUSE GOES INTO THE CAN— NOT INTO THE STREET

Why doesn't your city place Rochester cans on the street corners, in the parks and in all other convenient places. Rochester cans do away with unsightly littered streets. All rubbish goes into the cans — not into the gutters.

Made of the best materials and in many styles. Made by the makers of the famous "Iron Horse Brand" ash, garbage, street and trash cans.

Reasonable prices. Immediate shipments.

Send for illustrated catalog.

ROCHESTER CAN CO.
ROCHESTER, N. Y.

A STREET CAN

convenient for hurried City people. The Hood cover hides the contents from passers-by—the open ends allow papers, etc., to be easily and quickly deposited.

This Can may be used with sacks hung inside. Is made in set up or knock down shape

For complete description, ask

THE STEEL BASKET COMPANY
708 So. Third St., Cedar Rapids, Iowa

TREES SHRUBS EVERGREENS

800 ACRES

AMERICAN NURSERY CO.
Singer Building, New York

NURSERIES
Springfield, N. J. Flushing, L. I.

AMERICAN-GROWN TREES

OUR stocks of trees, shrubs and plants are not curtailed by the stoppage of foreign shipments. We sell Andorra-grown.

Catalog on request.

ANDORRA NURSERIES
Wm. Warner Harper, Prop.
Box 20, Chestnut Hill, Phila., Penna.

Thorburn's

1917 Catalog

A very large volume of Thorburn Seeds are furnished for parks and cemeteries.

Write us for catalog and let us know your requirements: and your letter will have our prompt and careful attention.

J. M. Thorburn & Co.
53 Barclay Street NEW YORK

MEEHAN
Nursery Stock
Needs no recommendation. It is know throughout the American Continent

225 acres

ORNAMENTAL TREES, SHRUBS, EVERGREENS and HARDY PLANT

Spring catalog now ready

THOMAS B. MEEHAN CO
Wholesale Nurseryman
DRESHER (Near Philadelphia) PA.

Burpee's Seeds Grow

BURPEE'S ANNUAL for 1918, the Leading American Seed Catalog contains the latest and most reliabl information about "The Best Seeds that Grow." 216 pages with 103 colored illustrations. It is ser free to those who write for it. Write for your copy today. A post card will do.

W. ATLEE BURPEE & CO. Seed Growers PHILADELPHI

Nurserymen, Florists and Seedsmen

Everything for Parks, Cemeteries and Private Places. Largest general assortment in America. Personal inspection invited. Special prices on car load lots. Switch from New York Central Ry. to our grounds. 1200 acres. Pleased to quote on your want list.

THE STORRS & HARRISON CO.

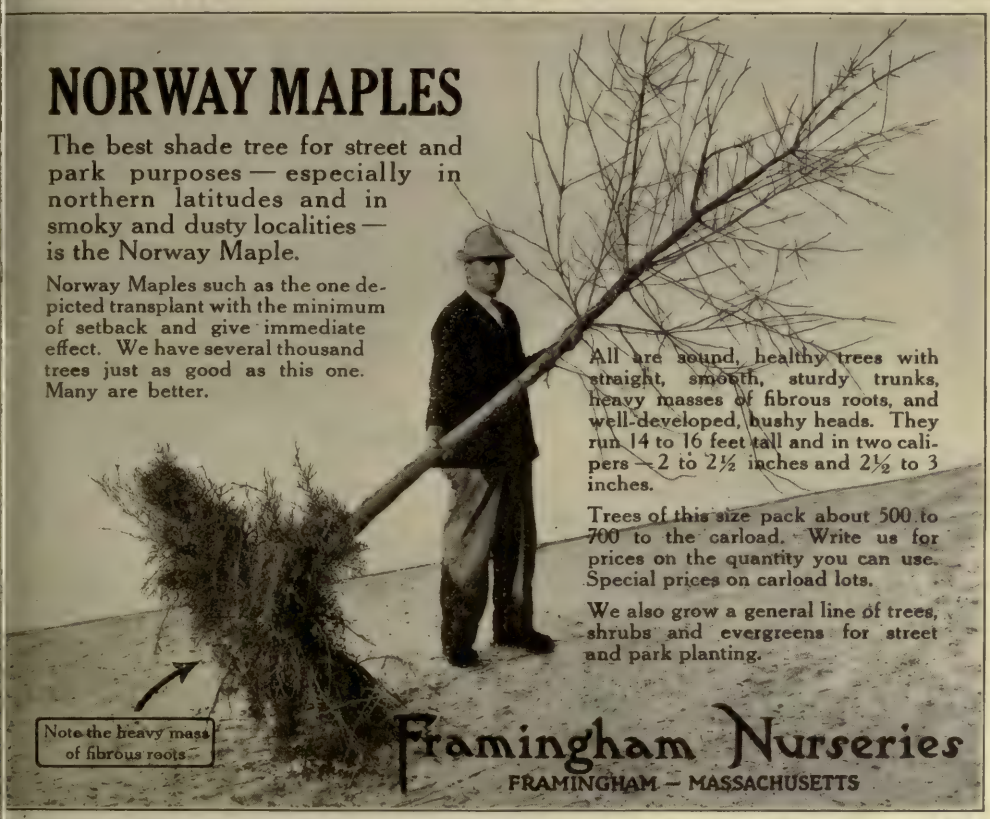
Landscape Dept.
627 Engineers Bldg.,
Cleveland, Ohio

Painesville,
Ohio

NORWAY MAPLES

The best shade tree for street and park purposes — especially in northern latitudes and in smoky and dusty localities — is the Norway Maple.

Norway Maples such as the one depicted transplant with the minimum of setback and give immediate effect. We have several thousand trees just as good as this one. Many are better.



All are sound, healthy trees with straight, smooth, sturdy trunks, heavy masses of fibrous roots, and well-developed, bushy heads. They run 14 to 16 feet tall and in two calipers — 2 to 2½ inches and 2½ to 3 inches.

Trees of this size pack about 500 to 700 to the carload. Write us for prices on the quantity you can use. Special prices on carload lots.

We also grow a general line of trees, shrubs and evergreens for street and park planting.

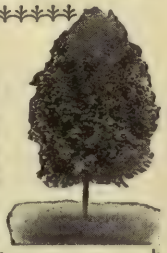
Framingham Nurseries
FRAMINGHAM — MASSACHUSETTS

Willadean Nurseries

Offer a very complete line of Trees, Shrubs and Ornamental stock for all kinds of Landscape work. Send your want lists for estimate. Trade list on application.

THE DONALDSON CO.
Box 22, SPARTA, KY.

Norway Maples



are unrivalled for shade and for landscape effects. We have a large stock of splendid specimens that will mature rapidly into towering round-topped trees, with clean, sturdy trunks. Also a complete stock of ornamentals. Over 2500 acres in nursery stock.

Write for 1918 Catalog and prices.

Harrisons' Nurseries, Box 70, Berlin, Md.

BOBBINK & ATKINS

World's Choicest Nursery and Greenhouse Products

We invite interested parties to visit our Nursery and inspect our Trees, Shrubs, Evergreens, Herbaceous Plants, Roses and other stock of which we have more than 300 acres.

OUR ILLUSTRATED GENERAL CATALOG No. 22 describes the high class Nursery material we grow.

SPECIAL PRICES quoted on lists for Public Parks.

Nurserymen, Florists and Planters, Rutherford, New Jersey

W. & T. SMITH COMPANY

NURSERY STOCK AT WHOLESALE

Send for Catalogue and Price List

GENEVA NURSERY, Geneva, N. Y.

Lewis & Valentine Co.
Roslyn, N. Y.
The World's Largest Movers of Big Trees.

Ornamental Trees, Shrubs, and Hardy Perennials

A complete stock.
Quality unexcelled.
Send for price list.

HENRY KOHANKIE & SON
Painesville, Ohio

SIGNS

Street Names, Catalog B

Road Direction, Park, Warning — Catalog C

Traffic, Catalog D

1918 Catalogs ready illustrated in colors
Send for ones that interest you

Joseph N. Early

Est. 1861

Patentee and Manufacturer

SIGNS ON SEPARATE POSTS

320 Broadway New York, N. Y.

Each Sign Plate protected i
an *"Early Patented Malleab*
Iron Frame."

Absolute Protection

Ornamental and Durable

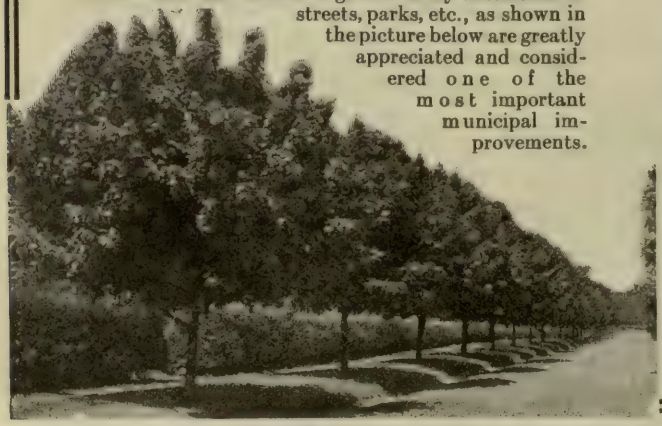
For Progressive Counties, Cities, etc., etc.

Shade Delivered With The Trees

3 to 5 years or more according to size saved over small saplings. We take the risk during their early tender life and you get the benefit.

We guarantee good trees of substantial growth and will replace any one that fails to thrive. We could not afford to make this offer if we did not know the good roots of trees that we furnish.

The value and benefit of good healthy shade trees in streets, parks, etc., as shown in the picture below are greatly appreciated and considered one of the most important municipal improvements.



Don't leave your streets barren and uninviting like the above. With a small outlay of money make your city attractive and a desirable place to live in.

Write today for literature on the subject.

Remember Hick's Trees are tall, straight and bushy and our 65 years in the business is a guarantee of quality.

HICKS NURSERIES

Westbury Long Island

OR *SAFE* TREE SURGERY—

for Tree Surgery that is scientifically accurate and mechanically perfect—for Tree Surgery that saves trees without guessing and experimenting—come to headquarters.

The Davey Tree Expert Co., Elm St., Kent, Ohio

Branch offices with telephone connections: 225 Fifth Ave., New York. 2017 Land Title Bldg., Philadelphia. 450 McCormick Bldg., Chicago.

Permanent representatives in all principal cities.

Davey Tree Surgeons

"A BETTER LAWN"

This little book tells how to have a perfect lawn. It describes in detail the

FULLER & JOHNSON MOTOR LAWN MOWER

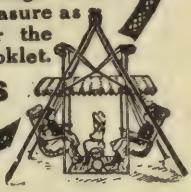
which combines flexibility with capacity and eliminates the "push." Designed for Parks, Cemeteries and Private Estates. Write for this book.

MANUFACTURERS DISTRIBUTING CO.
470 FULLERTON BLDG. ST. LOUIS, MO.

A SWING FOR PLAYGROUNDS

made strong and durable with heavy steel springs which makes swinging a pleasure as well as exercise for the children. Write for booklet.

NOLL BROTHERS
Benches and Swings
BAUSMAN, PA.



DREER'S GRASS SEEDS

¶ You sow a seed that is full of life and vigor when you sow

DREER'S GRASS SEED

¶ Special brands for every purpose—sunny or shady places, lawns, terraces; for city, park and seashore use. All brands composed of choicest, re-cleaned seed, carefully blended, and tested for germination.

¶ Write for prices or any desired information on lawn making. Special Grass Seed Circular—free.

DREER'S GARDEN BOOK FOR 1918 contains much information helpful to those interested in civic improvements which include flowers, shrubbery, etc. Sent free to anyone mentioning this publication.

HENRY A. DREER
714-716 Chestnut St. Philadelphia

Storm Insurance

ORANGEBURG *Fibre Conduit* will safeguard many thousands of Central Station, Telegraph, Telephone, Signal and other wires against the storms of the coming winter.

Will it safeguard *yours?* If not, *why* not?

Let us figure with you on the proposition of protecting *your* wires with ORANGEBURG *Fibre Conduit* "storm insurance." *Get BOOK D.*

THE FIBRE CONDUIT COMPANY
ORANGEBURGH, N. Y.

New York Boston Chicago San Francisco

Going To Do Any Painting?

The Spraco-pneumatic painting outfit is one of the most recent devices for reducing paint costs. The Spraco paint gun is a practical hand tool for use in applying all kinds of liquid coatings to smooth or rough surfaces.

The paint is "shot" on, making a better job in one-quarter the time required by old hand-brush methods.

The Spraco is ideal for all kinds of municipal painting and coating.

Write for complete information.

THE SPRAY ENGINEERING COMPANY
91 Federal Street - - Boston, Mass.

School grounds as well as the children are fully protected by this

EXCELSIOR

Chain Link Fence

As shown here it gives complete protection from outside influence as well as keeps the children within bounds. Does not obstruct the view and allows light and air from all points.

Excelsior Chain Link Fence is made of strong steel wires, heavily galvanized, of great tensile strength. They are particularly tough for the purpose and so woven as to make an exceedingly strong, firm, and durable fabric.

The posts shown here are galvanized steel, set in concrete or concrete footings. The top rail, of course, gives rigidity and prevents sagging. This fence can neither be climbed, burned nor broken down.

Send for catalog G, which gives information concerning the Excelsior products for public grounds.

WRIGHT WIRE COMPANY
Worcester, Mass.

We Can Do The Same For You

We are Consulting Engineers for Municipalities.

We designed, built and operated the Cleveland Mun ipal plant. Its maximum rate is 3 cents per K. W. ho

We represent cities in negotiations with the Util Corporations.

We prepare valuations and represent cities before State Commissions in rate cases for Electric Light, G Telephone, Water Works and Railway Fare Cases.

Write for Printed Matter

F. W. BALLARD & CO.
Engineers
Sweltand Building Cleveland, Oh

More AIR—More WORK
More ENERGY—Better HEALTH
by using
IDEAL VENTILATORS
on windows in your office. Prevent draughts do not obstruct light, save papers from blowing away. Inexpensive; made of glass.
Used in Federal, State and City offices al over the country.
Write TODAY for descriptive circular.

IDEAL VENTILATOR CO.
120 Liberty Street, New York Cit
Phone Rector 1339.

DIRECTORY OF CONSULTING ENGINEERS CONTRACTORS LANDSCAPE ARCHITECTS

xpert vice is Real onomy

Effective Construction Requires Wise Planning

right & Mebus
CIVIL ENGINEERS
planning and municipal improve-
parks, drainage, sewerage and
posal.
LAND TITLE BUILDING
PHILADELPHIA

JAMES M. CAIRD
Assoc. Am. Soc. C. E.
CHEMIST and BACTERIOLOGIST
OFFICE AND LABORATORY
271 RIVER STREET TROY, N. Y.
Water Analysis and Tests of Filter Plants

Analyses Tests Inspections
Consultations Reports Specifications
WALTER H. FLOOD
Chemical Engineer
PAVING AND ENGINEERING MATERIALS
Municipal Work a Specialty
326 River Street, CHICAGO

W. Alvord
d Chas. B. Burdick
SULTING ENGINEERS
ts, Investigations, Plans and
tions for Water Supplies,
Purification, Water Power,
e, Sewage Disposal.
ORD BLDG. CHICAGO

CHESTER & FLEMING
HYDRAULIC AND SANITARY ENGINEERS
Water Works, Water Filtration, Appraisements and Reports, Sewerage, Sewage Disposal, Operation of Properties.
UNION BANK BLDG. Pittsburgh

Fuller & McClintock
CONSULTING HYDRAULIC ENGINEERS and SANITARY EXPERTS
170 Broadway, New York City
George W. Fuller James R. McClintock
Jesse K. Giesey

FIELD A. ARNOLD
andscape Architect
Land Subdivisions
arks Institution Grounds
Private Estates
afield St. Boston, Mass.

LOUIS S. COLE
LANDSCAPE ARCHITECT
14 E. Jackson Blvd.
CHICAGO, ILL.
Specialist in City Planning, Playgrounds, Parks and Cemeteries.

Gannett, Seelye & Fleming
CONSULTING ENGINEERS
Civil, Hydraulic, Sanitary, Electrical, Municipal Problems
204 LOCUST ST., HARRISBURG, PA.

OLD & TRIPP
andscape Architects
anning, Land Subdivisions,
arks, Institution Grounds,
Private Estates
ian Bldg., Cleveland, Ohio

J. R. CRAVATH
Consulting Engineer
140 S. Dearborn St., Chicago
Street lighting.
Public utility rates and valuations.
Supervision of operation of electric plants.

SAMUEL A. GREELEY
64 W. Randolph St., Chicago
Hydraulic and Sanitary Engineer
Sewerage, Sewage Disposal, Water Supply and Filtration, Garbage and Refuse Disposal, Treatment of Industrial Waste, Supervision of Operation.

City, Mo. Interstate Bldg.
CK & VEATCH
Consulting Engineers
, Sewage Disposal, Water Sup-
er Purification, Electric Lighting,
lants, Valuations, Special Investi-
and Reports.

WILLIAM E. CULLEN
Landscape Architect and Designer
Ornamental Gardening, Beautifying Homes, Rural Districts, Towns, Schools, Yards, Parks and Cemeteries.
BOULDER, COLORADO

JOHN H. GREGORY
Consulting Hydraulic Engineer and Sanitary Expert
170 Broadway, New York City
Reports, Investigations, Plans and Specifications for Sewerage, Sewage Disposal, Water Supply, Water Purification and Garbage and Refuse Disposal.

I. BLANCHARD
Soc. C. E. M. Can. Soc. C. E.
NSULTING HIGHWAY ENGINEER
ADWAY and 117th STREET
NEW YORK CITY

The Duluth Engineering Co.
W. B. PATTON, Mem. Am. Soc. C. E., Ex-City Engineer Duluth, Manager
MUNICIPAL ENGINEERS
Waterworks, Sewerage, Electric Lighting, Town Planning.
Suite 612-616 Palladio Building
DULUTH, MINN.

James C. Harding,
Consulting Engineer and Sanitary Expert.
Water Supply and Purification. Refuse Disposal. Sewerage and Sewage Disposal. Investigations of Epidemics. Water Works Valuations. Supervision of Construction and Operation.
New York City, 170 Broadway

City, Mo. Interstate Bldg.
ns & McDonnell
CONSULTING ENGINEERS
aisals, Rate Investigations,
rt Testimony, Water Works,
Sewerage, Lighting.
S. Burns R. B. McDonnell

F. A. Dunham-Clarin Co.
CIVIL ENGINEERS
Municipal Engineering
Roads Sewers Supervision
Surveys
Topographic Title
Land Subdivisions
109 Park Ave. Tel. 610
PLAINFIELD, N. J.

Sid. J. Hare S. Herbert Hare
Fellow A.S.L.A. Member A.S.L.A.
HARE & HARE
Landscape Architects
604 Gumbel Bld., Kansas City, Mo.
Plans and Reports for Parks, Park Systems, Land Subdivisions, Estates, Municipal Improvements, Cemeteries

HAZEN, WHIPPLE & FULLER
CONSULTING HYDRAULIC
and SANITARY ENGINEERS
WATER SUPPLY and SEWERAGE
Allen Hazen — G. C. Whipple
W. E. Fuller — F. F. Longley
C. M. Everett — L. N. Babbitt
H. Malcolm Pirnie
30 East 42d St. NEW YORK CITY

GEORGE A. JOHNSON
M. Am. Soc. C.E.
Consulting Hydraulic Engineer and Sanitary Expert
150 Nassau St., New York.
Water Supply and Purification. Sewerage and Sewage Disposal. Plans and Reports. Supervision of Construction. Valuations. Improved Operation of Existing Plants. Investigation of Epidemics.

HUGH C. MITCHEL
GEODETIC ENGINEER
CONSULTANT ON CITY TRIANGULA
PRECISE LEVELS, AND TOPOGR
SURVEYS.
601 West 32d Street
AUSTIN, TEXAS

Arthur H. Helder
Landscape Architect
413 Reliance Bldg. Kansas City, Mo.

MUNICIPAL PROBLEMS
Budget Making—Salary Standardization—Centralized Purchasing—Cost Accounting—Public Utility Service and Rate Studies
J. L. JACOBS & COMPANY
Engineers—Cost Accountants—Municipal Experts
Monadnock Building Chicago

FRANK H. NUTTE
Landscape Architect and Engin
710 Sykes Block, Minneapolis,
Advice, Sketches, Designs or full ing Plans for Parks, Cemeteries, or Home Grounds Surveys ma desired. Correspondence Solicited
City Park Engineer from 1883 to

Rudolph Hering, D.Sc.
Consulting Engineer
170 Broadway New York
WATER SUPPLY, SEWAGE AND REFUSE DISPOSAL
Over 40 years active practice in United States and Canada

H. C. KITTREDGE
Consulting Hydraulic and Sanitary Engineer
ROCHESTER, N.Y.

POLLOCK AND TAB
CONSULTING ENGINEER
Pavements, Highways, Water S
Drainage, Sewerage and Sewage Di
Designs, Specifications and Superv
CLARENCE D. POLLOCK } Memb
GEORGE A. TABER } Am. Soc.
Park Row Building, New York

J. Wallace Higgins
Assoc. M. Am. Soc. C. E.
CIVIL AND LANDSCAPE ENGINEER
Municipal Engineering, Sewerage, Parks Cemeteries, Subdivisions, Topographic Surveys, Title Surveys, Estimates, Supervision
52 Vanderbilt Avenue, New York

A. Elliott Kimberly
SANITARY ENGINEER
Water Supply, Water Purification, Sewerage, Sewage Treatment, Industrial Waste Disposal
8 East Long St. COLUMBUS, OHIO

Alexander Potter, C.
Hydraulics, Sanitation, crete Structures Designe Executed.
50 Church Street, New Y
(Hudson Terminal) Tel., Cortlandt

Charles C. Hopkins
M. Am. Soc. C. E.
Consulting Hydraulic and Sanitary Engineer
349 Cutler Bldg., Rochester, N.Y.
Water supply and purification. Sewerage. Sewage and wastes disposal. Municipal engineering. Plans, reports, estimates, supervision. Expert testimony and appraisals.

MORRIS KNOWLES
Consulting, Sanitary and Hydraulic Engineer
Municipal, Community and Civic Problems
Pittsburgh, Penna.

Clyde Potts
50 CHURCH ST. NEW Y
Civil and Sanitary Engine
Sewerage and Sewage Disposal Hydraulics, Water Works, Filt Reports, Plans and Estimates.

LANDSCAPE DESIGN
Development of Parks, Cemeteries and Institution Grounds
Private Estates and Sub-divisions
M. H. HORVATH
Landscape Architect & Consulting Forester
649 Leader-News Building
Cleveland, Ohio

CHARLES W. LEAVITT
CITY PLANNING
and all branches of
CIVIL and LANDSCAPE ENGINEERING
220 Broadway NEW YORK

LOUIS E. STAND
Certified Public Accounta
Municipal and Public Utility Acco Rate and Capitalization Case
200 Fifth Avenue, New Y
Chief Acct.—Bd. of Ed. 1899-19
Acct—Pub. Service Com. 1908-1
Chief Auditor—Dept. Water Suppl and Electricity, 1912-1916.

GEORGE S. IREDELL
Landscape Architect & Municipal Engineer
904 Littlefield Bldg., Austin, Texas
Parks, Cemeteries, City Additions and City Planning, Beautification of Streets, Public Grounds, Estates, etc. Designs, Estimates and Complete Working Plans and Specifications for Laying out and Planting, also for Drainage, Paving and all other Improvements.

J. L. LUDLOW
Winston-Salem, N. C.
Consulting Municipal Engineer
Sanitary and C ic Expert
Water Supplies, Sewage Disposal, Reports, Plans, Valuations, Appraisals. Efficiency and Economy Studies, Physical and Financial Reports on Public Utilities in Southern Cities. Advice in Municipal Sanitation and Public Health. Interviews by appointment in Eastern Cities.

Sewage Disposal Pla
for Country Residences, Factories and tutions. Standard Plans and Specifi including description and estimate o of modern sewage treatment.
Blue Prints, 12 sheets, 9" x 12", $5.
LeRoy K. Sherman, Sanitary En
1102 Tacoma Bldg., Chicago.

The
JENNINGS-LAWRENCE CO.
CIVIL AND MUNICIPAL ENGINEERS
511-12 Hartman Bldg.
COLUMBUS OHIO

THOMAS MEEHAN & SONS
Practical Landscape Gardeners and Engineers
Especially qualified for work involving use of hardy plants. Large estate developments: country clubs. Plans executed.
"We know plants"
6703 Chew Street, Germantown, Phila., Pa.

New York City 2 Rector
A. E. HANSE
Hydraulic & Sanitary Engi
Design & Supervision of Construct
Sewerage — Water Works
Sewage Disposal — Water Purificat
Drainage — Water Works Valuation
Garbage Disposal — Water Analyses

/ICTOR A. RIGAUMONT
CITY PLANNER
erguson Bldg., Pittsburgh, Penna.
nsportation — Housing — Thoroughfares
IUNICIPAL PREPAREDNESS
A PRACTICABLE
OMPREHENSIVE CITY PLAN
ILD WHEN PRICES DECLINE
Correspondence Solicited

UTILITIES ENGINEERING CO.
S. Morecll F. C. Van Etten
O. F. Gayton R. F. Gayton
Plans, Superintendence-Reports, Valuations, Water, Gas, Electric Plants, Bridges, Buildings, Sewerage, Sewage Disposal
Webster Building, Chicago

Washtenaw Engineering Company
ANN ARBOR, MICH.
Water Supply; Sewerage and Sewage Disposal; Refuse Disposal; Roads and Pavements; Highway Bridges and Culverts; Drainage; Land Surveying, Subdividing, and Platting; Municipal Accounts and Systems; Municipal Street Lighting.

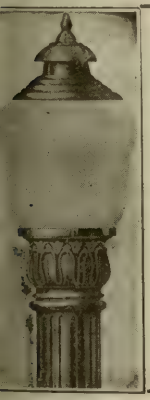
SCOTT TWOGOOD
ivil and Sanitary Engineer
4-15 Bank of Commerce and Trust Bldg.
MEMPHIS, TENN.
ter Supply, Water Purification, Sewerage tems, Sewage Disposal, Reinforced Conte Structures, Municipal Improvements, eration of Purification Plants, Laboratory for Analysis of Water and Sewage.

WARREN ENGINEERING CO.
Specializing in Municipal Water Supply and Purification, Sewerage and Sewerage Disposal, Paving.
DECATUR ILLINOIS

MARK WOLFF
Certified Public Accountant
Consultant
Rate & Capitalization Cases
Gas, Electric & Water Utilities
1328 Broadway
New York City
Municipal Accounting

Robert W. Hunt Jno. J. Cone Jas. C. Hallsted D. W. McNaugher
ROBERT W. HUNT & CO.,
GENERAL OFFICES:
2000-175 W. Jackson Blvd., Chicago, Ill.
ENGINEERS, INSPECTORS, CHEMISTS
Inspection Steel and Cement for Buildings and Bridges, Paving Materials, Cast Iron Pipe.
Inspectors Permanently at Points of Manufacture.

Butler Refuse Cans
are neat cans
The collected refuse in Butler Cans doesn't show up before your eyes.
It is covered from view (see illustration). These cans are shipped "knock-down" thus saving big freight bills. Write for particulars.
The Butler Mfg. Co.
St. Anthony Falls Sta.
Minneapolis, Minn.
Also makers of "Rus-Pruf" corrugated culverts with B.M.C. Wings



King Poles and G. E. tops make the best lighted streets
Send for our beautifully illustrated booklet—free.
Send name and address today.
KING FOUNDRY CO.
55 W. Jackson Blvd.
Chicago, Ill.

SCOFIELD
ENGINEERING COMPANY
PHILADELPHIA
As
Consulting Engineers
We offer a professional engineering service of unusual value for
Municipal Improvements
Sewerage, Water Works, Electric Systems, High Pressure Pumping Stations, Streets and Bridges. Also for
Public Service Properties
Railway, Electric, Gas, Water, Hydraulic.
Write for further free information

We Must "Follow-Up"

The story of the Gallipoli withdrawal is a tale of inadequate support. Like Salamanders clinging to the red-hot bars of a fiery furnace, the boys of Australia and New Zealand clung to the slopes of Anzac. Desperately, heroically they clung. No troops under any circumstances ever displayed greater soldierly qualities or upheld more sacredly the best traditions of England's Army. But they had to withdraw because the "follow-up" was not there.

To some of us it has been given to march with the columns of troops that go to France. And to others it is given to wave Godspeed. But he who marches and he who stays is equally a citizen of the world's mightiest republic and equally responsibl for its success in this greatest of unde takings.

Then let us at home turn from our fla waving and consider how necessary w are, how useful we must be. Those wh go to fight cannot hope to win by nake bravery and we cannot hope to win unles every individual at home does *all* he car We must have no Gallipoli.

The Bell System is only one of th myriad great and small industries whicl are co-operating that nothing be left un done to keep a constant, efficient strear of men, guns, ammunition, food, clothin and comforts flowing to the front

AMERICAN TELEPHONE AND TELEGRAPH COMPAN
AND ASSOCIATED COMPANIES

One Policy *One System* *Universal Servic*

When writing to Advertisers please mention THE AMERICAN CITY.

DU PONT AMERICAN INDUSTRIES

The Builder of Nations—Dynamite

Mail this Coupon marking X before subject that interests you

- ___ Industrial Dynamites
- ___ Blasting Powder
- ___ Farm Explosives
- ___ Blasting Supplies
- ___ Trapshooting
- ___ Py - ra - lin Toilet Goods
- ___ Challenge Collars
- ___ Sanitary Wall Finish
- ___ Town & Country Paint
- ___ Liquid Light for Mills
- ___ Rayntite Top Material
- ___ Motor Fabrikoid
- ___ Metal Lacquers
- ___ Commercial Acids
- ___ Pigment Bases
- ___ Tar Distillates
- ___ Dyes and Bases

Name.....

Address.....

City.....

State.....

A titantic laborer—wresting from the bosom of Mother Earth the stone, the ore, the coal, that are essential to modern life—tunneling under rivers and through mountains for the railroads that span the continent, and cleaving hemispheres for the canal that links the oceans.

In this class of constructive national forces the palm of leadership goes to

DU PONT

Red Cross Dynamite

the world's leading brand of industrial explosives. Powerful, quick, low-freezing, insensitive to ordinary shocks of transportation and handling. Safer than gasoline or gunpowder. It represents a distinct achievement of American scientific research and manufacturing skill. Many million of pounds are used annually by civil, railroads and mining engineers, contractors, road builders, quarrymen and farmers.

It is not a fearsome Frankenstein but a tractable, powerful servant. Learn its uses. Fill in and check the coupon opposite. 'Industrial Explosives" or "Farm Explosives" and send for full information.

E. I. Du Pont De Nemours & Co.

Established 1802

Wilmington, Delaware

DU PONT

The Noiseless Typewriter

Rests its claim upon the fact that concentration of thought is essential to success in business.

Typewriter Noise—sharp, metallic and rasping—distracts attention, upsets the nerves and impairs health.

The Noiseless Typewriter saves and earns for its owner every moment of the business day because it aids clear, quick thinking and because it is a foe to nervous indigestion.

Send for literature and an impressive list of users; or better still, ask for a demonstration and test at your own office.

The Noiseless Typewriter Company

253 BROADWAY, NEW YORK

Other Offices in

CHICAGO
PHILADELPHIA
BOSTON
DETROIT
CLEVELAND
SAN FRANCISCO
LOS ANGELES
and MONTREAL

Street Signs Road Guide Posts Traffic Signs

The Kind That Last

Made of Heavy Galvanized Iron with letters sunken into plate.

If you are looking for *permanent* signs instead of the short lived ordinary variety write to us for prices, illustrations and further particulars.

Union Iron Products Co.
Drawer H-2 E. CHICAGO, IND.

Here's the Way

to build concrete culverts!

No fussing with wood bracing which is a very slow and expensive method—

THIS WAY IS VASTLY CHEAPER THAN METAL PIPE CULVERTS
and as cheap and far more substantial than clay tile.

The One-Man Collapsible Culvert Form

Our Illustrated Booklet contains a lot of valuable information about Culvert Building. Write for free copy

Storms Mfg. Co.
347 Monadnock Blk.
CHICAGO

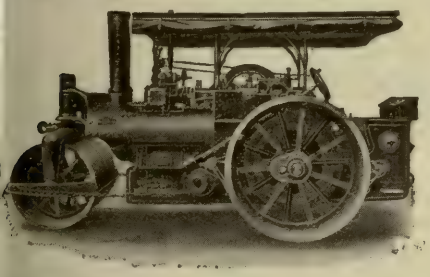
ittleford Tar Heaters

Many municipalities have found the "Littleford" a valuable and economical asset in Street Repair work.

Write for booklet.

TTLEFORD BROS. 500 E. Pearl St., Cincinnati

QUALITY MACHINERY



BUFFALO PITTS ROLLERS

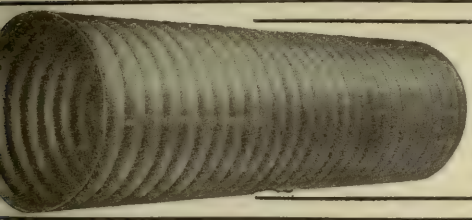
Are purchased by discriminating buyers because of the many years of satisfactory service which they will render, the low repair costs and their general reliability.

ASK THOSE WHO OWN THEM

All sizes All Types Write for catalogue

Built only by

THE BUFFALO-SPRINGFIELD ROLLER COMPANY
SPRINGFIELD, OHIO



Collieries Supply and Equipment Co.

Culvert Pipe and Road Machinery

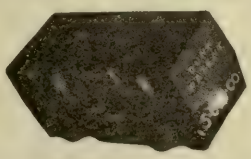
Contractors, Road Makers and Municipal Supplies

Sectional Cast Iron Culvert Pipe Corrugated Iron Culvert Pipe Scarifiers Road Signs Road Scrapers Road Drags Rock Crushers Road Rollers Write for Prices

14 North Fifth Street Philadelphia Pa.

OUTHERN CLAY MFG. CO.

James Building
CHATTANOOGA, TENN.



Annual Capacity:
Thirty Million Paving Blocks

Manufacturers of

WIRE-CUT-LUG BLOCKS
DUNN PATENT

Business After the War

WHAT is your business going to be after the war—an institution or a memory? Are you grooming yourself for second place—for oblivion—or for leadership? You may have anything you want—but you must decide *now*. You cannot wait until peace is declared and then decide. What you do with, to and for your business *during* the war is going to determine just where you'll stand *after* the war.

You cannot eat your cake and have it too. You cannot hide your head in the sand until the storm is over and then make the public believe that you are one of the country's big, bold captains of industry. Did you think that you could *embalm* your business for the period of the war and then resuscitate it at will? It can't be done.

This country isn't going out of business!

J. Pierpont Morgan, the elder, made all of his money "by always being a bull on the United States!" No matter what else went up or down he always played the United States for a rise. Don't you think he would play the game the same way today—and don't you think he would win bigger than ever?

The country's going ahead just the same—with or without you—but don't you wish, just for your own sake, that you had a little more of that Morgan faith and optimism and the courage they breed?

If your business is built on *publicity*—on the public's knowledge of you and its good-will toward you—are you going to keep that knowledge alive and that good-will active—or not?

Suppose you can't fill your orders now—suppose your facilities are all taken up with war work—or you can't get enough cars to ship in—or the public isn't buying your goods just now—or any one of a thousand things—are you going to invite the public to forget you?

The public has a short memory. Are you willing to risk its forgetfulness—even to invite it? Figure it out in dollars and cents. *Can you afford it?*

The calmest judges of affairs in the country prophesy a post-war period of prosperity for America such as the world has never seen! And every man who thinks knows that it is true. The figures of after-the-war trade are going to stagger even the optimists. A *world* is to be rebuilt, re-clothed, re-furnished and re-stocked—entertained, amused and educated all over again. The institutions that build their places in the public good-will *now* are going to do the job—at enormous profit and satisfaction to everybody concerned.

Businesses that are firmly intrenched in the public *mind* and the public *good-will* when the war ends are going to make fortunes while the others are getting started. Yours will not be one of them unless you lay the foundation *now*. THE AMERICAN CITY is going through the war with *full steam up* and invites all good advertisers to go along.

The above material was prepared by W. M. Hart of the Photoplay Magazine, thru whose courtesy we are adapting it as an advertisement for THE AMERICAN CITY.

Ransome-Leach Company

Representing a new service for contractors and builders. A combination of great importance to contractors and builders marking a new era in the contractors equipment field has been completed in the consolidation of the Ransome Concrete Machinery Company and the Oshkosh Manufacturing Company.

This new organization, known as the Ransome-Leach Company, through economic effort in manufacturing and marketing offers a service that has a far reaching significance for both contractor and dealer. A service that has hitherto been unapproached in the contractors world.

Ransome-Leach Company

NEW YORK - 115 BROADWAY
OSHKOSH, WISCONSIN

The TAYLOR

PORTABLE STEEL DERRICK with Gondola Car Attachment for HANDLING PIPE or other heavy material from gondola cars.

Catalog illustrating the Taylor Portable Steel Derricks furnished on application.

TAYLOR PORTABLE STEEL DERRICK CO.
213 W. Grand Ave., Chicago, Ill.

RUSSELL SNOW PLOW

Adjustable and All-Steel

Delivered at any railroad station, freight paid

at $39.75

Adjustable widths: 4 ft., 4½ ft., 5 ft., 5½ ft. and 6 ft. adjustments made by two bolts (or pins) hinged at front and on both sides; rigid and strong; hard wood handles.

This is the latest of our Line of Road Working and Earth Handling Machinery. Send for Catalog.

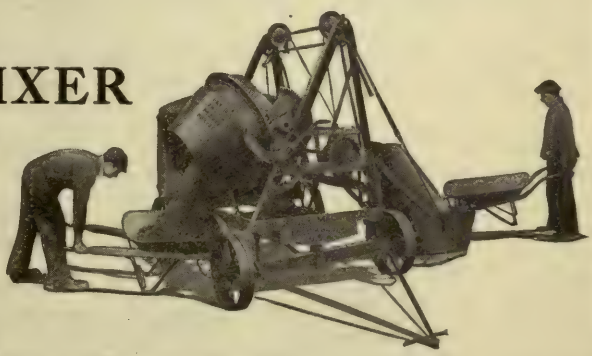
Russell Grader Mfg. Co. - **MINNEAPOLIS - MINNESOTA**
Representatives in Principal Cities

JAEGER CONCRETE MIXER

Used by all progressive municipalities and contractors.
Is your town progressive?

WRITE FOR DATA

The Jaeger Machine Co.
215 West Rich Street
COLUMBUS .·. .·. .·. OHIO



For Municipal Health Officers

The Examination of Milk for Public Health Purposes

By Joseph Race, F.I.C., City Bacteriologist and Food Examiner, Ottawa, etc. vi+224 pages. 5¼ by 8. Cloth, $1.75 net.

Intended as a practical handbook for those engaged in the chemical and bacteriological examination of milk for public health purposes. Contains data which will enable the examiner to interpret the results obtained. The book treats of Constituents of Milk, Normal Composition of Milk, Chemical Examination, Bacteria in Milk, Enumeration of Bacteria in Milk, Excremental Organisms, Pathogenic Organisms, Cells, Dirt and Debris.

For Municipal Water Works

Meter Rates for Water Works

By Allen Hazen, S.D., Mem. Am. Water Works Assoc., etc. v 217 pages. 6 by 9, 21 figures. Cloth, $2.25 net.

Deals with the problems of supporting a water-works system among those who use the water, in a just and equitable manner. The methods of handling statistics and of making calculations found most careful in application and useful in results are shown. Diagrams showing the meter rates now in force in many American cities are given. Chapter Headings: Reasons for Meters, beginning of the Meter Business, Forms of Meter Rates Now in Use, Graphical Comparison of Meter Rates, The New England Water Works Association Form of Rate, The Minimum Rate, The Service Charge, Minimum Rate Based on Frontage, Comparison of Forms of Rate, As to Services and Meters, As to the Water that Cannot be Accounted for, Leakage from Street Mains, Under-Registration of Meters, As to Whether or Not the Scale Should Slide, The Three-Charge Rate, Making the Rate Schedule, A More Detailed Analysis, Fixing Meter Rates for a System Not Yet Metered, Extra Rates for High Service Districts, Competition of Local Sources of Supply.

Clean Water and How to Get It

By Allen Hazen, S.D., Member American Society of Civil Engineers, etc. Second Edition, Revised and Enlarged. xii+196 pages. 5¼ by 8. 18 full-page half tone illustrations. Cloth, $1.50 net.

Deals with the means now used by American cities to secure clean water. Includes chapters upon the red-water trouble and upon the disinfection of water supplies.

Examination of Water; *Chemical and Bacteriological.*

By William P. Mason, Professor of Chemistry, Rensselaer Polytechnic Institute. Fifth Edition, Thoroughly Revised. vi+186 pages. 5 by 7¼. Illustrated. Cloth, $1.25 net.

In this new edition tests more suited to modern practice have taken the place of those used in former printings. The Analytical methods have been placed in harmony with the recommendations of the 1917 report of the Standard Methods Committee of the American Public Health Association.

Highway Engineering

By Arthur H. Blanchard, C.E., A.M., Professor of Highway Engineering in Columbia University, and Henry B. Drowne, C.E., Instructor in Highway Engineering in Columbia University. xiii+762 pages. 6 by 9, 234 figures. Cloth, $4.50 net.

Treats all phases of the subject of modern highway engineering and is sufficiently broad in its scope and content to serve as a comprehensive reference-book for the experienced engineer.

10 DAYS FREE EXAMINATION

John Wiley & Sons, Inc., 432 Fourth Ave., N. Y. City.

Gentlemen:—Kindly send me for 10 days free examination the following books:

.....

.....

.....

It is understood that I am to remit the price of these books, or return them, carriage charges prepaid, within 10 days after their receipt.

Name.....

Address.....

(Indicate on the line above if you are a subscriber to American City; or give the name of the engineering society of which you are a member. If you are not a member of any society, kindly give a reference or state your position. AC 2-18

Free Examination — No Cash In Advance

You can examine these books for 10 days, without sending cash in advance. This privilege is extended to subscribers to *American City*, or to members of any National engineering society. If you are not a subscriber or a member of any society, you can supply a reference, or indicate your position.

JOHN WILEY & SONS, Inc.

432 Fourth Avenue, New York

London: CHAPMAN & HALL, Ltd.

Montreal, Canada — Renouf Publishing Co.

Manila, P. I. — Philippine Education Co.

Every detail of construction in

KOLESCH Instruments

has been studied in order to give you an instrument unequalled for accuracy, with great strength, and light weight.
Kolesch Quality means unvarying reliability.

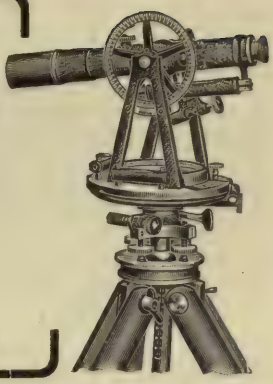
We will gladly send Municipal Engineers

an Instrument to test and try out, absolutely without obligation to purchase, unless it proves to be "the instrument you want."

Engineering Instruments and Supplies

TRADE MARK

KOLESCH & CO., 138 Fulton Street, New York



DIXON'S SILICA-GRAPHITE PAINT

Pigment-Flake Silica-Graphite
Nature's own product, mined from the same bed. The silica is hard, the graphite is soft, each helps the other, both practically indestructible—an idea pigment for protective purposes.
Vehicle-Boiled Linseed Oil
No paint vehicle has yet been found to equal linseed oil—the only improvement is to boil it.
Our Part
We blend the silica-graphite and best quality boiled linseed oil by long, careful and scientific grinding, into a harmonious, protective paint that for over 50 years has been making long-time records for endurance and low cost.
Write for Booklet No. 107-B.

Made in JERSEY CITY, N. J. by the
JOSEPH DIXON CRUCIBLE CO.

D X N TRADE MARK — **Established 1827** — D X N TRADE MARK

BUFF

ENGINEERING INSTRUMENTS

are the strongest, most accurate and longest-lived Instruments built. The close accuracy, high grade materials and superior workmanship have made the Buff the recognized standard. *Write for catalog No. 4.*

BUFF & BUFF MFG. CO.
Jamaica Plains, BOSTON, MASS.
221 Lamartine Street — 231 N. Wells Street, Chicago, Ill.

ODORLESS — STAINLESS

DUSTOLINE FOR ROADS

TRACKLESS — (TRADE MARK) — TRANSPARENT

THE DUSTOLINE FOR ROADS CO., Summit, N. J., Phone 33
Has none of the objectionable features of the black asphaltic oils or tar preparations

PIONEER Highest Quality ASPHALTS

"High Quality Materials for High Quality Work"
Bituminous Materials for every purpose

THE PIONEER ASPHALT CO.
LAWRENCEVILLE, ILL.

Did You Read Page 34?

You'll be missing something of value if you don't.
Turn to page 34 now.

ROADWAY ECONOMY

SOLVAY Granulated Calcium Chloride keeps roads clean, dustless, durable and sanitary at a minimum expense.

SOLVAY
Granulated
Calcium Chloride

can be applied by ordinary road-laborers, and a few applications a season are sufficient to keep the road in perfect condition all the year round.

Solvay Granulated Calcium Chloride is a dry, stain'ess, colorless, odorless chemical salt — unquestionably the most economical and satisfactory dust preventive and road binder.

All interested in good roads are invited to write for the "Solvay Road Book", mailed free upon request.

SEMET-SOLVAY CO.
410 Milton Ave. :: Solvay, N. Y.

Adams Grader Building an Illinois Road

Maintains Better Streets At Less Cost

For grading and shaping-up gravel or macadam streets at a saving in time and money, use the Adams Grader or Grader-Scarifier. It leans its weight against the load, thereby moving *more* dirt with *less* power.
The

ADAMS
ADJUSTABLE
Leaning-Wheel
GRADER

is guaranteed in actual road building or maintenance, to move more dirt with less power (mold board scouring and without side draft on the power) than any other grader of same length blade.

The economy and efficiency of the ADAMS Adjustable Leaning-Wheel Grader can be PROVED by TEST on your own road, before a sale is made. Write for free illustrated catalog showing ADAMS Adjustable Leaning-Wheel Graders at work under various conditions. Ask for Catalog C.

The ADAMS Leaning-Wheel Grader leans against the load just as you'd do if you were pushing a wheel-barrow up a hill. Catalog C gives full information.

J. D. ADAMS & CO.
Road Building Machinery
INDIANAPOLIS, IND.

and so does the ADAMS grader

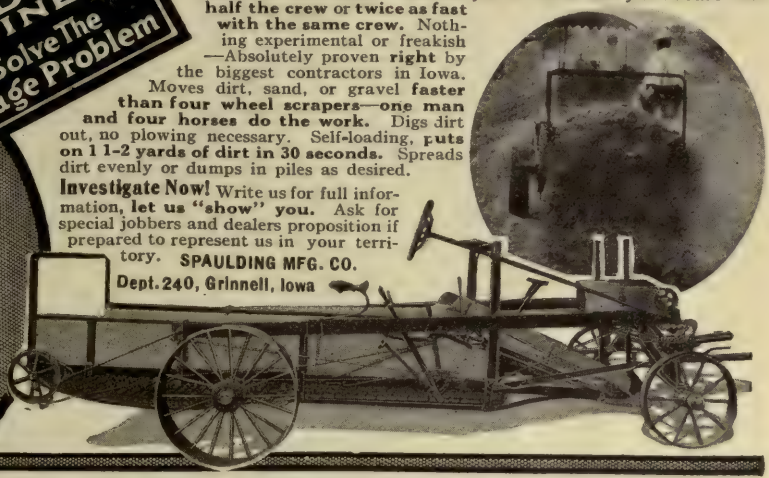
SPEEDING UP!

Handles Dirt Faster And Cheaper 50%

SPAULDING 2-IN-1 ROAD MACHINE
Helps You Solve The Labor Shortage Problem

The new, modern, fast and **easy** way to handle dirt. A special machine that **cuts costs.** Enables you to **move dirt** just **as fast with half the crew** or **twice as fast with the same crew.** Nothing experimental or freakish—Absolutely proven **right** by the biggest contractors in Iowa. Moves dirt, sand, or gravel **faster than four wheel scrapers—one man and four horses do the work.** Digs dirt out, no plowing necessary. Self-loading, **puts on 1 1-2 yards of dirt in 30 seconds.** Spreads dirt evenly or dumps in piles as desired.

Investigate Now! Write us for full information, **let us "show" you.** Ask for special jobbers and dealers proposition if prepared to represent us in your territory. **SPAULDING MFG. CO.**
Dept. 240, Grinnell, Iowa



A City Official

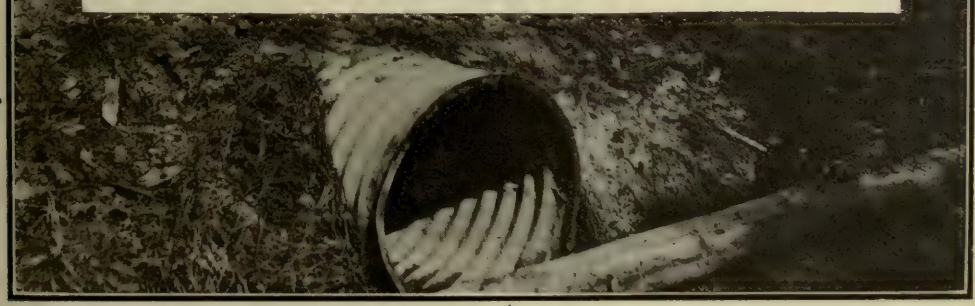
writing us recently says among other things: "Your

'Genuine Open Hearth Iron' Culverts

are certainly well adapted to city use as they can be laid nearer the surface of our streets than other types of culvert and are much easier installed than the pipes that come in short sections."

A pure Iron-Copper Alloy Sheet with a heavy spelter coat makes an ideal material for culvert construction. And that's what our culverts are made of. They are practically permanent. Let us send you our booklet and prices.

The NEWPORT CULVERT CO., Inc.
NEWPORT, KY.



The Municipal Buyers' Guide

A classified reference index of advertisers in this issue of The American City

The alphabetical index of advertisers which follows this list (see page 100) will give you the page numbers of all advertisements, thus enabling you to secure the full address of the advertisers, as well as other information which may be of value.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 100

Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark

Acoustics.
Mazer Acoustile Co.

Aerial Ladder Trucks.
Couple-Gear Freight-Wheel Co.

Air Compressors.
General Electric Co.
Modern Iron Works
Water Works Equipment Co.
Worthington Pump & Mach. Corp.

Air and Gas Washers.
Spray Engineering Co.

Ambulances.
White Co., The

Antoxide.
Harrisons, Inc.

Arc Lamps.
General Electric Co.
Westinghouse Elec. &Mfg. Co.

Armored Concrete Pavements.
Trussed Concrete Steel Co.

Asbestos.
Carey Co., Philip.

Asphalt.
Carey Co., Philip.
Pioneer Asphalt Co.
Standard Oil Co.
Warren Bros. Co.

Asphalt Machinery.
Casey-Hedges Co.
Littleford Bros.
Warren Bros. Co.

Automobile Fire Apparatus.
American-La France Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Couple-Gear Freight-Wheel Co.
Duplex Truck Co.
Federal Motor Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
South Bend Motor Car Works.
Sterling Motor Truck Co.
The White Co.

Automobile Lubricants.
Joseph Dixon Crucible Co.

Belt Dressing.
Joseph Dixon Crucible Co.

Blasting Supplies.
DuPont de Nemours & Co., E. I.

Blue Print Paper and Machines.
Kolesch & Co.

Braces, Extension.
Bond & Co., Harold L.
Modern Iron Works.

Brass Goods.
Anderson Coupling & Fire Sup. Co.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co

Brick, For Paving.
Dee Co., Wm. E.
Metropolitan Paving Brick Co.
Southern Clay Mfg. Co.
Schuylkill Valley Vit. Products Co.

Buses, Motor.
White Co., The

Calculating Machines.
Marchant Cal. Machine Co.

Campaigns for Commercial Organizations.
American City Bureau.

Cans for Ashes and Garbage.
American Can Co.
Baker Mfg. Co.
Buffalo Municipal Equipment Co.
Butler Mfg. Co.
Newport Culvert Co.
Rochester Can Co.
Steel Basket Co.

Can Carriers.
Steel Basket Co.

Cast Iron Pipe.
Donaldson Iron Co.
Glamorgan Pipe & Foundry Co.
Lynchburg Foundry Co.
Massillon Iron and Steel Co
Zelnicker Supply Co., W. A.

Catch Basins.
Buffalo Municipal Equipment Co.
Casey-Hedges Co.
Clark Co., H. W.
Clow & Sons, James B.
Dee Co., Wm. E.
Modern Iron Works.
U. S. Cast Iron Pipe & Foundry Co.

Catch Basin Cleaning Apparatus
Otterson Auto-Eductor Co.

Caulking Materials.
Leadite Co.
Modern Iron Works.
United Lead Co.

Cemcoat.
Sonneborn Sons, Inc., L.

Cement
Atlas Portland Cement Co.
Pennsylvania Cement Co.

Cement Inspection.
Hunt & Co., Robt. W.

Centrifugal Pumps.
Shone & Co.
Worthington Pump & Mach. Corp.

Certified Public Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark

Check Valves.
Columbian Iron Works.

Chemical Analysis.
Hunt & Co., Robt. W.

Chemical Engines.
American-La France Fire Engine Co
Anderson Coupling & Fire Sup. Co.

Chemical Engineers.
Hunt & Co., Robt. W.

Chemicals for Water Purification.
Arnold, Hoffman & Co.
Bush-Beach & Gent.
Electro Bleaching Gas Co.
General Filtration Co.
Great Western Electro Chem. Co.
Pennsylvania Salt Mfg. Co.
Wallace & Tiernan Co., Inc

Coal Tar.
Barrett Co., The
Carey Co., Philip.

Cold Storage and Refrigeration Systems.
Spray Engineering Co.

Concrete Culverts.
Storms Mfg. Co.

Concrete Mixers.
Jaeger Machine Co.
Ransome Leach Co.
Worthington Pump & Mach. Corp

Conduit Rods.
Bissell Co., F.
Bond & Co., Harold L.
Turbine Sewer Machine Co.

Conduits.
Fibre Conduit Co.
Schuylkill Valley Vit. Prod. Co.

Contractors' Equipment.
Adams & Co., J. D.
Austin-Western Road Machy. Co
Baker Mfg. Co.
Bond Co., Harold L.
Duplex Truck Co.
Federal Motor Truck Co
Garford Motor Truck Co.
General Motors Truck Co.
Good Roads Machinery Co.
Littleford Bros.
Packard Motor Car Co.
Ransome Leach Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.
Sterling Motor Truck Co.
Universal Road Machinery Co.

Contractors for Water Main Cleaning.
National Water Main Cleaning Co.

Culverts.
American Cast Iron Pipe Co.
Armco Iron Cul. & Flume Mfrs. Assn
Baker Mfg. Co.
Casey-Hedges Co.
Clow & Sons, James B.
Collieries Supply & Equipment Co.
Dee, Wm. E. Co.
Good Roads Machinery Co.
Newport Culvert Co.
Trussed Concrete Steel Co.
Sewer Pipe Mfrs. Association
Storms Mfg. Co.
U. S. Cast Iron Pipe & Foundry Co.
Wood & Co., R. D.

Curb Bar.
Trussed Concrete Steel Co.

Curb Boxes.
Casey-Hedges Co.
Clark Co., H. W.
East Iron & Machine Co.
Modern Iron Works
S. E. T. Valve & Hydrant Co.

Current Meters.
Westinghouse Electric & Mfg. Co.

Derricks.
Taylor Portable Steel Derrick Co.

Drawing Instruments and Supplies.
Gurley, W. & L. E.
Kolesch & Co.

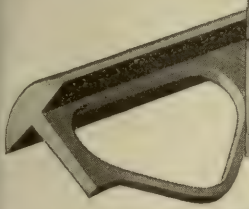
Dump Carts and Wagons.
Austin-Western Road Machy. Co
General Motors Truck Co.
Watson Wagon Co.

Dumping Wagon Bodies.
Austin-Western Road Machy. Co

Continued on page 92

BACK OF THE PERFECT CURBING ARE KAHN CURB BARS

They provide the best and most economical method of protecting and reinforcing concrete curbing for either business or residential streets. There is no separating or splitting of the concrete at the corners, on account of the open spaces in the anchorage, which is absolutely positive.



Kahn Curb Bars are manufactured from special rolled steel sections, and are heavily galvanized after forming. They are furnished in either straight or curved bars and provide a protection of 1⅝ inches. Standard lengths 8, 10 and 12 feet.

TRUSSED CONCRETE STEEL COMPANY

Department C-43 **Youngstown, Ohio**

Representatives in Principal Cities

KAHN Building Products
TRUSSED CONCRETE STEEL CO.

Monarch Tandem Roller
Made in 5, 6, 9, and 10 ton sizes

Because of Labor and Material Shortage Machinery will be the Dominant Factor in Building and Maintaining Streets and Roads

We furnish a complete line of Street Building Equipment for Cities, Counties and Towns, including Steam Road Rollers, all sizes, Portable and Stationary Crushing Plants, Oil Distributors, Heating Kettles, Street Sweepers, Road Graders, Rooter Plows and Culvert Pipe. Catalog and prices on application.

A small portable crushing plant, like the Champion, will enable cities to secure crushed stone from local deposits. Crushed stone will be hard to get in any other way during the coming year.

Write today for prices. Don't wait.
Delays this year will be dangerous.

THE GOOD ROADS MACHINERY CO.

Kennett Square, Pa.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 100

Dust Laying Compounds.
Barrett Mfg. Co.
Dustoline for Roads Co.
Semet-Solvay Co.
Standard Oil Co.

Electric Current Meters.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Generators and Motors.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Lamp Fixtures.
Cutter Co., George.
Electric Railway Equipment Co.
Holophane Glass Co., Inc.

Electric Lamps.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electrical Supplies.
Bissell Co., F.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Enameled Iron Signs.
Baltimore Enamel & Novelty Co.

Engineers' and Surveyors' Instruments.
Buff & Buff Mfg. Co.
Kolesch & Co.

Engineers, Consulting.
Albright & Mebus.
Alvord, John W. & Brudick, Chas.
Ballard & Co., F. W.
Black & Veatch
Blanchard, A. H.
Burns & McDonnell.
Caird, James M.
Chester & Fleming.
Cravath, J. R.
Crosby, W. W.
Duluth Engineering Co.
Dunham-Clarin Co.
Flood, Walter H.
Fuller & McClintock.
Gannett, Seelye & Fleming.
Greeley, Samuel A.
Gregory, John H.
Harding, James.
Hazen, Whipple & Fuller.
Hering, Rudolph
Higgins, J. Wallace.
Hopkins, Charles C.
Hunt & Co., Robt. W.
Jennings, Lawrence & Lindsey.
Johnson, Geo. A.
Kimberly, A. Elliot
Knowles, Morris.
Leavitt, Chas. W.
Ludlow, J. L.
McCrary Co., J. B.
Minnesota Engineering Co.
Mitchell, Hugh C.
Pollock, Clarence D.
Potter, Alexander.
Potts, Clyde.
Scofield Engineering Co.
Utilities Engineering Co.
Warren, Engineering Co.
Washtenaw Engineering Co.

Engine, Gas (See Gas Engines.)

Expansion Joint Material.
Barrett Mfg. Co.
Carey Co., Philip.
Pioneer Asphalt Co.
Trussed Concrete Steel Co.

Fencing.
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Co.
Wright Wire Co.

Fertilizers.
Dreer, Henry A.

Filters-Feed Water.
Pittsburgh Filter Mfg. Co.

Filtration Plants.
N. Y. Continental-Jewell Filtra. Co.
Norwood Engineering Co.
Pittsburgh Filter Mfg. Co.

Fire Alarm Cables.
Bissell Co., F.
Simplex Wire & Cable Co.

Fire Alarm Signals, Steam.
Union Water Meter Co.

Fire Alarm Systems.
Anderson Coupling & Fire Sup. Co.
Gamewell Fire Alarm Telegraph Co.
Loper Fire Alarm Co.

Fire Department Apparatus.
American-LaFrance Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Couple-Gear Freight-Wheel Co.
Duplex Truck Co.
Federal Motor Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
South Bend Motor Car Works.
Sterling Motor Truck Co.
White Co. The

Fire Department Supplies.
Anderson Coupling & Fire Sup. Co.

Fire Escapes.
Barnum Iron Works, E. T.

Fire Extinguishers, Chemical.
American LaFrance Fire Engine Co
Anderson Coupling & Fire Sup. Co.

Fire Hose.
Anderson Coupling & Fire Sup. Co.
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

Fire Pumps.
Worthington Pump and Machinery Corporation.

Flag Poles.
Barnum Iron Works, E. T.

Flexible Joints.
U. S. Cast Iron Pipe & Fdry. Co.

Flower Bed Guards.
Barnum Iron Works, E. T.
Wright Wire Co.

Fountains.
Barnum Iron & Wire Works, E. T
Casey-Hedges Co.
Clow & Sons, James B.
Mott Iron Works, J. L.
Rundle-Spence Mfg. Co.
Stewart Iron Works Co.

Furnaces, Melting.
Leadite Co.
Modern Iron Works

Garbage Cans—See Cans for Ashes and Garbage.

Garbage Wagons.
Austin-Western Road Machy. Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
Watson Wagon Co.
White Co., The

Gas Engines.
Bruce-Macbeth Engine Co.
Westinghouse Electric & Mfg. Co.
Worthington Pump & Mach. Corp

Gaskets.
Leadite Co.

Gas Meters.
General Electric Co.
Pittsburgh Meter Co.

Gasoline Pumping Engines.
Bond Co., Harold L.
Modern Iron Works
Worthington Pump & Mach. Corp.

Gasoline Storage Tanks.
Bowser & Co., Inc., S. F.

Gates For Parks and Cemeteries
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Company.
Wright Wire Co.

Gauges—Surface, Reservoir and Special Water Works.
Clark Co., H. W.

Graders.
Adams & Co., J. D.
Austin-Western Road Machy. Co
Baker Mfg. Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Graphite.
Dixon Crucible Co., Joseph

Grass Seed.
Burpee Co., W. Atlee
Dreer, Henry A.
Thorburn & Co., J. M.

Health and Amusement Devices.
American Playground Device Co
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Noll Bros.

Hitching Posts.
Barnum Iron & Wire Works, E. T
Casey-Hedges Co.

Holophane Refractors
Holophane Glass Co., Inc.

Hose.
Anderson Coupling & Fire Sup. Co
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

House Numbers.
Baltimore Enamel & Novelty Co
Buffalo Municipal Equipment Co.

Hydrants
Clow & Sons, James B.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Mfg. Co.
Norwood Engineering Co.
Pratt & Cady Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co
Wood & Co., R. D.

Indicator Posts.
Columbian Iron Works.
Flower-Stephens Mfg. Co.
Ludlow Valve Mfg. Co.
Pratt & Cady, Inc.
Rensselaer Valve Co.

Insulating Materials.
Bissell Co., F.
Carey Co., Philip.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Insulated Wire and Cable.
Bissell Co., F.
General Electric Co.
Simplex Wire & Cable Co.

Iron Collapsible Forms For Moulding Concrete.
Clark Co., H. W.
Ford Meter Box Co.
Stroms Mfg. Co.

Jail Cells and Jail Work.
Barnum Iron Works, E. T.

Joints, Flexible.
Coldwell-Wilcox Co.

Kahn Armour Plates.
Trussed Concrete Steel Co.

Continued on page 94

Clean Streets

In order to have and maintain clean, "dustless" streets, the use of a strong, durable street sweeper is essential. The Reliance Sweeper has won fame throughout the contry as THE sweeper.

Sweeps clean any kind of pavement. Simple in construction—simple to operate. Made of the best materials.

Effectiveness, Strength and Durability are its Main Features.

WRITE FOR ILLUSTRATED BOOKLET

THE UNIVERSAL ROAD MACHINERY CO.

KINGSTON, N. Y.

(An" Armco" Iron Culvert being placed under the California State Highway near Fresno, California.)

When War Makes Labor Scarce

it is a satisfaction to know that unskilled men can install

"ARMCO" IRON CORRUGATED CULVERTS

quickly and efficiently. They are shipped without delay, hauled easily, placed quickly, and will last a generation.

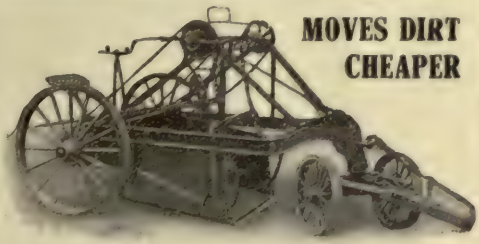
Their unfailing durability is their chief recommendation. They are made of "Armco" iron—the purest and most rust-resisting iron that can be used.

For full information on Rust-Resisting "Armco" Iron Culverts, Flumes, Siphons, Sheets, Roofing, and Formed Products, write.

AMERICAN ARMCO

Resists Rust

Armco Iron Culvert & Flume Mfrs. Association, Cincinnati, Ohio



MOVES DIRT CHEAPER

THE BAKER-MANEY 4-WHEEL SCRAPER

This self-loading dump wagon saves from 25 to 50% over other methods. Holds a cubic yard and loads at the rate of a yard a minute.

BAKER

Road and street products have a reputation for saving labor and time. Get complete information on our

"UNCLE JIM" ROAD LEVELERS
20th CENTURY ROAD GRADERS
BAKER PICK-UP SWEEPERS
STREET CARTS, DUMP BOXES.

Catalog No. 50 describes all products. Send for it today.

THE BAKER MFG. CO.

503 Stanford Ave., Springfield, Ill.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 100

Landscape Architects.
Arnold, Sheffield A.
Cole, Louis S.
Cowell, Arthur W.
Cullen, Wm E.
Davey Tree Expert Co.
Hare & Hare.
Helder, Arthur H.
Higgins, J. Wallace.
Horvath, M. H.
Leavitt, Chas. W.
Nutter, Frank H.

Lapidolith.
Sonneborn Sons, Inc., L.

Lawn Mowers.
Austin Western Road Machy. Co.
Manufacturers Distributing Co.
Pennsylvania Lawn Mower Works
Shawnee Mower Co.
Townsend & Co., S. P.

Lawn Sweepers and Sprinklers.
Everwear Mfg. Co.
Pennsylvania Lawn Mower Co.
Spray Engineering Co.

Lead Furnaces and Caulking Tools.
Clow & Sons, James B.
Modern Iron Works.
Water Works Equipment Co.

Leadite.
Leadite Co.

Lead Wool.
United Lead Co.

Leak Finders.
Clark & Co., H. W.
Modern Iron Works
Pitometer Co.
Water Works Equipment Co.

Liquid Chlorine.
Arnold, Hoffman & Co.
Bush-Beach & Gent.
Electro Bleaching Gas Co.
Great Western Electro Chem. Co.
Pennsylvania Salt Co.
Wallace & Tiernan Co., Inc.

Lighting Standards.
Casey-Hedges Co.
Cutter Co., George.
Electric Railway Equipment Co.
King Foundry Co.
Mott Iron Works, J. L.
Stewart Iron Works Co.

Lubricants.
Dixon Crucible Co., Joseph.

Manhole Covers.
Barnum Iron Works, E. T.
Casey-Hedges Co.
Clark Co., H. W.
Clow & Sons, James B.
Columbian Iron Works.
East Iron & Machine Co.
Modern Iron Works.
Mott Iron Works, J. L.
S. E. T. Valve & Hydrant Co.
U. S. Cast Iron Pipe & Foundry Co.
Wood & Co., R. D.

Merry-Go-Rounds.
American Playground Device Co.
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.

Metal Preservatives.
Dixon Crucible Co., Joseph.
Harrisons, Inc.

Meter Books.
Buffalo Meter Co.
Pittsburgh Meter Co.

Meter Boxes.
Buffalo Meter Co.
Casey-Hedges Co.
Clark Co., H. W.
Clow & Sons, James B.
Columbian Iron Works.
Ford Meter Box Co.
Hersey Mfg. Co.
Modern Iron Works
Pittsburgh Meter Co.
S. E. T. Valve & Hydrant Co.

Meter Couplings.
Clark Co., H. W.
Ford Meter Box Co.
Modern Iron Works
Pittsburgh Meter Co.

Meter Holding Devices.
Ford Meter Box Co.
Modern Iron Works

Meter Testers.
Buffalo Meter Co.
Clark Co., H. W.
Ford Meter Box Co.
Neptune Meter Co.
Pittsburgh Meter Co.

Meters—See Water and Gas Meters.

Motor Trucks.
Couple-Gear Freight-Wheel Co.
Duplex Truck Co.
Federal Motor Truck Co.
General Motors Truck Co.
Garford Motor Truck Co.
Packard Motor Car Co.
Sterling Motor Truck Co.
White Co., The.

Motor Fire Apparatus—See Automobile Fire Apparatus.

Motor Truck Trailers.
Watson Wagon Co.

Municipal Auditors
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark

Noise Elimination.
Mazer Acoustile Co.

Nurseries.
Andorra Nurseries.
Atlantic Nursery Co.
Berckmans Co., P. J.
Bobbink & Atkins.
Donaldson Co.
Dreer, Henry A.
Harrison Nursery Co.
Hicks Nurseries.
Hill Nursery Co., Inc., D.
Kohankie & Son, Henry
Meehan Co., Thomas.
Smith Co., W. & T.
Storrs & Harrison Co.

Ornamental Metal Fencing.
Barnum Iron & Wire Works, E. T.
Mott Iron Works Co., J. L.
Stewart Iron Works Co.
Wright Wire Co.

Packing.
Carey Co., Philip.

Paint Gun (Pneumatic.)
Spray Engineering Co.

Park Management & Advice
Benjamin E. Gage

Park Benches.
American Playground Device Co.
Ashland Mfg. Co.
Barnum Iron & Wire Works E. T.
Casey-Hedges Co.
Enterprise Iron Works.
Mott Iron Works, J. L.
Noll Brothers.
Stewart Iron Works Co.

Park and Lawn Sprinklers.
Penn. Lawn Mower Works
Spray Engineering Co.

Park Swings.
Noll Brothers.

Paving Inspection.
Hunt & Co., Robt. W.

Paving Machinery and Tools.
Baker Mfg. Co.
Warren Bros. Co.

Paving Materials. (See also under Brick and Cement.)
Baker Mfg. Co.
Barrett Co., The
Carey Co., Philip.
Schuylkill Valley Vitrified Prod. Co
Standard Oil Co.
Warren Bros. Co.

Paving Mixers.
Warren Bros. Co.
Worthington Pump and Machinery Corporation.

Paving Mixtures.
Standard Oil Co.

Pencils, Drafting, Office.
Dixon Crucible Co., Joseph.

Pipe.
American Cast Iron Pipe Co.
Casey-Hedges Co.
Cast Iron Pipe Pub. Bureau, R. C. McWane, Sec.
Central Foundry Co.
Clow & Sons, James B.
Donaldson Iron Co.
Glamorgan Pipe & Foundry Co
Lynchburg Fdry. Co.
Massillon Iron & Steel Co.
U. S. Cast Iron Pipe & Foundry Co
Warren Fdry. & Machine Co.
Wood & Co., R. D.
Zelnicker Supply Co., W. A.

Pipe Covering.
Carey & Co., Philip.

Pipe Cutters.
Water Works Equipment Co.

Pipe Handling Machinery.
Taylor Portable Steel Derrick Co.

Pipe Joint Compound.
Dixon Crucible Co., Joseph.

Pipe Jointing Materials.
Leadite Co.
United Lead Co.
Water Works Equipment Co

Pipe Locators.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co.

Pitch.
Barrett Co., The
Carey Co., Philip.

Pitometers.
Pitometer Co., The

Playground Apparatus.
American Playground Device Co.
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.

Continued on page 96

NO DELAYS FOR LOADING
WATSON TRAILERS
Set out your WATSON TRAILERS in the yard or on the job. Load or unload them without delaying your motor equipment. Trucks are away working while the gang handles the load on the trailers.
Use the full power of your motor equipment.
WATSON TRAILERS will increase the motor truck's hauling capacity as high as 400% in many cases.
Watson Trailers and Semi-Trailers are built in capacities up to 5 tons. Platform body or bottom dump. Full details on the pamphlet—"Heavy Hauling." Write for your copy.
WATSON WAGON Co
30 East Center Str.
Canastota, N.Y.
LEON BAKER

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 100

Plumbing Supplies.
Clow & Sons, James B.

Pneumatic Tools.
United Lead Co.

Poles, Combination Railway and Lighting.
Cutter Co., George.
Electric Railway Equipment Co
Mott Iron Works, J. L.
Ornamental Lighting Pole Co.

Police Patrols.
General Motors Truck Co.
White Co., The.

Police Signal Cables.
Simplex Wire & Cable Co

Police Signal Systems.
Gamewell Fire Alarm Telegraph Co.

Portable Derricks.
Taylor Portable Steel Derrick Co.

Portland Cement.
Pennsylvania Cement Co.

Powder.
DuPont de Nemours & Co., E. I.

Producers—Gas Power Plants.
Bruce-Macbeth Engine Co.
Westinghouse Electric & Mfg. Co.

Publishers.
Appleton & Co., D.
Engineering News-Record.
Wiley & Sons, John.

Pumping Machinery.
Bond Co., Harold L.
Deming Co.
Shone Co.
Wood & Co., R. D.
Worthington Pump and Mach. Corp.

Ramshorn Meter Holding Frame.
Ford Meter Box Co.

Refractors.
Holophane Glass Co., Inc.

Reinforcing for Paving.
Trussed Concrete Steel Co.

Repair Lids for Service Boxes.
Clark Co., H. W.
Modern Iron Works.

Road and Street Machinery.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Baker Mfg. Co.
Barber Asphalt Paving Co.
Buffalo-Springfield Roller Co.
Duplex Truck Co.
Garford Motor Truck Co.
The Good Roads Machinery Co.
Littleford Bros.
Newport Culvert Co.
Packard Motor Car Co.
Ransome Concrete Machinery Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.
Universal Road Machinery Co.
Warren Bros. Co.
White Co., The.

Road Binders.
Barrett Co., The
Semet-Solvay Co.
Standard Oil Co.

Road Culverts.
Armco Iron Cul. & Flume Mfrs. Assn.
Casey-Hedges Co.
Clow & Sons, James B.
Collieries Supply & Equipment Co.
Good Roads Mach'y. Co.
Newport Culvert Co.
Storms Mfg. Co.
U. S. Cast Iron Pipe & Fdy. Co.
Wood & Co., R. D.

Road Drag and Street Scrapers.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Baker Mfg. Co.
The Good Roads Machinery Co.
Newport Culvert Co.
Rochester Can Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Road Oil.
Barrett Co., The
Dustoline for Roads Co.
Standard Oil Co.

Road Oilers.
Austin-Western Road Mchy. Co.
General Motors Truck Co.
Good Roads Machinery Co.,
Universal Road Machinery Co.
White Co., The.

Road Rollers.
Austin-Western Road Machy. Co.
Buffalo-Springfield Roller Co.
Good Roads Machinery Co.

Rock Crushers.
Austin-Western Road Machy. Co.
Good Roads Mach'y. Co.,
Universal Road Machinery Co.
Worthington Pump and Mach. Corp.

Roofing
Barrett Co., The
Carey Co., Philip

Rubber Tires.—See Tires, Rubber.

Rubbish Burners.
Barnum Iron Works, E. T.

Rust Preventing Material.
Dixon Crucible Co., Jos.
Harrisons, Inc.

Safety Manhole Cover.
East Iron & Machine Co.

Sand Spreaders.
Buffalo Municipal Equipment Co.

Sanitary Drinking Fountains.
Barnum Iron Works
Casey-Hedges Co.
Clow & Sons, James B.
Mott Iron Works, J. L.
Rundle-Spence Mfg. Co.
Stewart Iron Works Co.

Scarifiers.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Good Roads Machinery Co.
Newport Culvert Co.
Universal Road Machinery Co.

Seeds, Plants and Bulbs.
Burpee Co., W. Atlee.
Dreer, Henry A.
Hicks Nurseries.
Storrs & Harrison Co.
Thorburn & Co., J. M.

Service Boxes.
Casey-Hedges Co.
Clark Co., H. W.
Clow & Sons, James B.
Modern Iron Works.
Water Works Equipment Co.

Service Box Finders.
Clark Co., H. W.

Sewage Disposal.
Spray Engineering Co.

Sewage Ejectors.
Otterson Auto-Eductor Co.
Shone Co.

Sewer Brick.
Schuylkill Valley Vit. Prod. Co.

Sewer Buckets.
Champion Potato Machinery Co.
Metropolitan Paving Brick Co.

Sewer Castings.
Casey-Hedges Co.
Clark Co., H. W.
Dee Co., Wm. E.
Enterprise Iron Works.

Sewer Cleaning Apparatus.
Buffalo Municipal Equipment Co.
Champion Potato Machinery Co
Turbine Sewer Machine Co.

Sewer Jacks.
Ashland Mfg. Co.

Sewer Pipe.
Dee Co., Wm. E.
Sewer Pipe Mfrs. Assn.

Sewer Rods.
Bissell Co., F.
Bond Co., Harold L.
Champion Potato Machinery Co.
Clow & Sons, James B.
Turbine Sewer Machine Co.

Sheer Gates.
Chapman Valve Mfg. Co.
Columbian Iron Works.
Rensselaer Valve Co.

Signs—Iron and Wire.
Barnum Iron Works, E. T.
Buffalo Municipal Equipment Co
Early, Jos. N.
Union Iron Products Co.

Sleeves and Valves.
Flower-Stephens Mfg. Co.
Rensselaer Valve Co.

Sluice Gates and Valves.
Chapman Valve Mfg. Co.
Coldwell Wilcox Co.
Columbian Iron Works
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Rensselaer Valve Co.

Snow Plows.
Baker Mfg. Co.
Good Roads Machinery Co.,
Newport Culvert Co.
Russell Grader Mfg. Co.

Snow Cleaning Machinery
Good Roads Machinery Co.
Russell Grader Mfg. Co.

Soil Pipe (Cast Iron)
Abendroth Bros.
Alabama Pipe & Foundry Co.
American Enameling Mfg. Co
American Foundry & Pipe Co.
Anniston Foundry Co.
Bessemer Soil Pipe Co.
Campbell Mfg. Co.
Casey-Hedges Co., The.
Central Foundry Co
Charlotte Pipe and Foundry Corp
Coosa Pipe & Foundry Co.
Crown Pipe and Foundry Co.
Gadsden Pipe Co.
Haines, Jones & Cadbury Co.
Johnson Co., J. D.
Krupp Foundry Co.
Medina Foundry Co.
National Pipe & Fdry. Co.
Reading Foundry & Supply Co.
Salem Brass & Iron Mfg. Co.
Sanitary Co. of America
Somerville Iron Works, The.
Standard Foundry Co.
Superior Mfg. Co.
Union Foundry Co.
Weiskittel & Son Co., A.
Wetter Mfg. Co., H.

Sound Control
Mazer Acoustile Co.

Spiral Riveted Pipe.
Casey-Hedges Co.

Spraying Machinery for Trees and Shrubs.
Deming Co.

Spray Nozzles.
Spray Engineering Co.

Continued on page 98

THE STANDARD METHOD of SURFACE TREATMENT

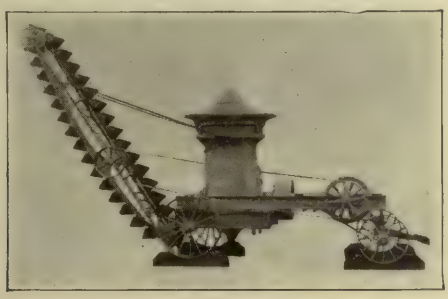
Below is a water bonded Gravel Road treated with Stanolind Paving Asphalt at 300°F., 45 pounds pressure, applied one-half gallon to the square yard by special pressure tank wagon shown in other illustration.

One application of Stanolind Paving Asphalt on Macadam and Gravel Roads has given three years' service with practically no expense. Builds more substantial surface at half the cost of light oil treatment for three years. Can be applied on roads previously treated with Road Oil.

Write today for free booklet, "Stanolind Paving Asphalt."

STANDARD OIL COMPANY
(INDIANA)
72 W. Adams Street, Chicago, Ill.

Austin Portable Gyratory Crushers



are the economical solution of many difficulties arising in street, sewer and bridge or building construction; in fact, any job entailing broken stone supply within city limits.

Austin Gyratory Crushers, both fixed and portable types, have been used on such work as New York Subway and Water Tunnels and Chicago city streets to crush old paving blocks and in the water tunnel under Lake Michigan. Their reliable working and excellent construction saved thousands of dollars on these projects of first importance.

Write for catalog.

AUSTIN MANUFACTURING COMPANY - CHICAGO

New York Office—50 Church St.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisers follows this classfied list. See page 100

Standpipes.
Casey-Hedges Co.
Wood & Co., R. D.

Steel Derricks.
Taylor Portable Steel Derrick Co.

Street Cleaners Carts.
Baker Mfg. Co.

Street Cleaning Machines (Hand).
Baker Mfg. Co.

Street Cleaning Machines (Motor Driven).
Baker Mfg. Co.
Garford Motor Truck Co.
General Motors Truck Co.
White Co., The.

Street Flushers.
Buffalo Municipal Equipment Co.
Garford Motor Truck Co.
General Motors Truck Co.
Good Roads Co.
Sterling Motor Truck Co.
White Co., The.

Street Lamps—Electric.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Street Lamp Posts.
Barnum Iron Works, E. T.
Casey-Hedges Co.
Cutter Co., George.
Electric Railway Equipment Co.
King Foundry Co.
Mott Iron Works, J. L.
Stewart Iron Works Co.

Street and Road Graders.
Adams & Co., J. D.
Austin-Western Road Machy. Co
Good Roads Mach'y Co.
Newport Culvert Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Street and Road Signs.
Baltimore Enamel & Novelty Co
Buffalo Municipal Equipment Co.
Early, Jos. N.
Union Iron Prod cts Co.

Street Sign Posts.
Casey-Hedges Co.
Cutter Co., George.
Early Jos. N.
Mott Iron Works, J. L.

Street Sprinklers.
Austin-Western Road Machy Co.
Buffalo Municipal Equipment Co.
Duplex Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Good Roads Co.
Newport Culvert Co.
Sterling Motor Truck Co.
Water Works Equipment Co.
White Co., The.

Street Sweepers.
Austin-Western Road Machy. Co.
Universal Road Machinery Co.

Street Trash Cans.
American Can Co.
Butler Mfg. Co.
Collieries Supply & Equipment Co.
Rochester Can Co.
Steel Basket Co.

Surveyors Instruments.
Buff & Buff Co.
Kolesch & Co.

Tanks, Storage for Oils and Gasoline.
Bowser & Co., Inc., S. F.

Tanks and Towers.
Casey-Hedges Co.
Newport Culvert Co
Wood & Co., R. D.
Zelnicker Supply Co., W. A.

Tapping Machines.
Water Works Equipment Co.

Tar.
Barrett Co., The

Tar & Asphalt Spreaders
White Co., The.

Tar Kettles.
Casey-Hedges Co
Good Roads Machinery Co.
Littleford Bros.
Warren Bros. Co.

Tar Wagons.
Casey-Hedges Co.

Tarvia.
Barrett Co., The

Testing Laboratories.
Hunt & Co., Rob't. W.

Tires, Rubber.
Dayton Rubber Mfg. Co.
Firestone Tire & Rubber Co.
Republic Rubber Co.
U. S. Tire Co.

Traction Engines.
Buffalo Springfield Roller Co.

Traction Trains.
Buffalo Springfield Roller Co.

Tractors.
American-La France Fire Engine Co.
Garford Motor Truck Co.
General Motors Truck Co.
Watson Wagon Co.
White Co., The.

Traffic Posts.
George Cutter Co.

Traffic Regulation Signs.
Baltimore Enamel & Novelty Co.
Buffalo Municipal Equipment Co.
Early, Jos. N.
Union Iron Products Co.

Trailers.
Buffalo Springfield Roller Co.
Watson Wagon Co.

Tree and Flower Bed Guards
Mott Iron Work, J. L.
Wright Wire Co.

Trench Braces.
Bond Co., Harold L.
Clow & Sons, James B.

Trench Pumps.
Bond Co., Harold L.
Deming Co.
Modern Iron Works
Water Works Equipment Co.
Worthington Pump & Mach. Corp.

Turbines.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Vacuum Pumps.
Deming Co.
Worthington Pump & Mach. Corp

Valves.
Ashland Mfg. Co.
Chapman Valve Mfg. Co.
Clow & Sons, James B.
Coldwell-Wilcox Co.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Pratt & Cady Co., Inc.
Rensselaer Valve Co.
S E. T. Valve & Hydrant Co.
Water Works Equipment Co
Wood & Co., R. D.

Valve Boxes and Housings.
Casey-Hedges Co
Clark Co., H. W.
Clow & Sons, James B
Columbian Iron Works.
Eddy Valve Co.
Flower Stephens Mfg. Co.
Ludlow Valve Co.
Modern Iron Works.
Pratt & Cady Co., Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
U. S. Cast Iron Pipe & Foundry Co
Wood & Co., R. D.

Valve Seats.
Wood & Co., R. D.

Valve Specialties.
Chapman Valve Mfg. Co
S. E. T. Valve & Hydrant Co.

Ventilators.
Ideal Ventilator Co.

Wagons and Carts.
Watson Wagon Co.

Water Main Cleaning.
National Water Main Cleaning C

Water Meters.
Badger Meter Mfg. Co.
Buffalo Meter Co.
General Electric Co.
Hersey Mfg. Co.
Neptune Meter Co.
Pittsburgh Meter Co.
Thomson Meter Co.
Union Water Meter Co.
Worthington Pump & Mach. Corp.

Waterproofing.
Barrett Mfg. Co.
Carey Co., Philip
Minwax Co.
Sonneborn Sons, Inc., L.
Trussed Concrete Steel Co.

Water Purification Chemicals.
See Chemicals for Water Purificatio

Water Regulators.
Modern Iron Works
Union Water Meter Co.

Water Towers.
Casey-Hedges Co.

Water Works Specialties.
Casey -Hedges Co.
Chapman Valve Mfg. Co.
Clark Co., H. W.
Clow & Sons, James B.
Flower-Stephens Mfg. Co.
Leadite Co.
Minwax Co.
Modern Iron Works
Pittsburgh Filter Co.
Rensselaer Valve Co.
S. E. T. Valv & Hydrant Co.
Union Water Meter Co.
United Lead Co.
Warren Fdry. & Machine Co.
Water Works Equipment Co.

Weed Killers
Chipman Chemical Engineering Co.

Well Construction and Equipment
Clark Co., H. W.

Wheel Scrapers.
Adams & Co., J. D.
Austin-Western Road Machy Co.
Good Roads Machinery Co.,

Wire and Cable.
Bissell Co., F.
General Electric Co.
Simplex Wire & Cable Co.

Wire-Cut-Lug Brick.
Metropolitan Paving Brick Co
Southern Clay Mfg. Co.

Wood Preservatives.
Barrett Co., The

PENNSYLVANIA
Quality LAWN MOWERS

AN economical mower is one which gives superior constant service and lasts.

The 1,500,000 "PENNSYLVANIA" *Quality* Lawn Mowers sold, have proved their economy.

They run easily—do not drag. The design carries them *over* the ground freely—the material and construction of the bearings reducing friction.

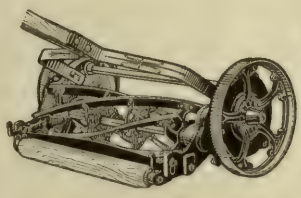
They cut clean—the *quality* of steel in the blades *keeps* the edges ground by the self-sharpening device.

A man can mow more lawn and better, with a "PENNSYLVANIA" *Quality* Lawn Mower.

Sold by Hardware Dealers and Seedsmen.

FREE A booklet—"How to Care for the Lawn" —written by an authority, mailed on request.

PENNSYLVANIA LAWN MOWER WORKS
JOHN BRAUN & SONS
FOUNDED 1877 PHILADELPHIA



This trade mark is on the handles of:

"Pennsylvania"
"Pennsylvania, Jr."
"Pennsylvania Golf"
"Pennsylvania Putting Greens Mower"
"Continental"
"Great American B. B."
"Shock Absorber"
"Quaker City"
"Red Cloud B. B."
"Orchid B. B."
"Daisy"
"New Belmont"
"Bellevue"
"Panama"
"Delta B. B."
"Electra"
"Pennsylvania Pony"
"Pennsylvania Horse"
"Pennsylvania Grand Horse"
"Pennsylvania Trio Horse" (86 in. cut)

Index to Advertisers in this Issue of The American City

.roth Bros 21
.as & Co., J. D 88
.bama Pipe & Foundry Co 21
.bright & Mebus. 77
Alvord, J. W., & C. B. Burdick 77
American Can Co 70
American Cast Iron Pipe Co 22
American City Bureau 68
American Enameling Mfg. Corp. 21
American Foundry & Pipe Co 21
American-LaFrance Fire Eng.Co. 50
American Nursery Co 71
American Playground Device Co 63
Am.Iron Culvert&Flume Mfrs.Ass'n 93
American Telephone and Teleg. Co. 80
Anderson Coup. & Fire Supply Co 59
Andorra Nurseries 71
Anniston Foundry Co 21
Appleton & Co., D 67
Arnold, Hoffman & Co 22
Arnold, Sheffield A 77
Arnold & Tripp 77
Ashland Mfg. Co 63
Austin Western Road Mach'y Co 97

Badger Meter Mfg. Co 18
Baker Mfg. Co 93
Ballard & Co., F. W 76
Baltimore Enamel and Novelty Co. 52
Barnum Iron Works, E. T 66
Barrett Co., The 102
Bessemer Soil Pipe Co 21
Bi-Lateral Fire Hose Co 58
Bissell Co., F 26
Black & Veatch 77
Blanchard, Arthur H 77
Bobbink & Atkins 73
Bond Co., Harold L 28
Bowser & Co. Inc., S. F 56
Bruce-Macbeth Engine Co 25
Buff & Buff Mfg. Co 87
Buffalo Meter Co 33
Buffalo Municipal Equipment Co. 28
Buffalo Springfield Roller Co 83
Bureau of Municipal Research 60a
Burns & McDonnell 77
Burpee & Co., W. Atlee 72
Bush-Beach-Gent 30
Butler Mfg. Co 79

Caird, James M 77
Campbell Mfg. Co 21
Carey Co., Philip 4-5
Casey-Hedges Co 65
Cast Iron Pipe Publicity Bureau . 8-9
Central Fdy Co 21-23
Champion Potato Machinery Co 22
Chapman Valve Mfg. Co 37
Charlotte Pipe and Foundry Co 21
Chester & Fleming 77
Chipman Chemical Engineering Co 69
Clark Co., H. W 33
Clow & Sons, James B 55
Coldwell-Wilcox Co 27
Cole, L. S 77
Columbian Iron Works Co 26
Collieries Supply & Equip. Co 83
Coosa Pipe & Foundry Co 21
Couple-Gear Freight Wheel Co 56
Cravath, J. R 77
Crown Pipe & Foundry Co 21
Cullen, Wm. E 77
Cutter, Geo. Co 101

Davey Tree Expert Co 75
Dayton Rubber Mfg. Co 59
Dee Co., Wm. E 25
Deming Co., The 28
Dixon Crucible Co., Joseph 87
Donaldson Co., (Willadean Nurs.). 73
Dreer, Henry A 75
Duluth Engineering Co 77
Dunham-Clarin Co. F. A. 77
Duplex Truck Co 59
Du Pont Powder Co 81
Dustoline for Roads Co 87

Early, Jos. N 74
East Iron & Machine Co 33
Eddy Valve Co 26
Electric Railway Equipment Co 43
Electro Bleaching Gas Co 28

Engineering News-Record 40
Enterprise Iron Works 65
Everwear Mfg. Co 12-13

Fabric Fire Hose Co 59
Federal Motor Truck Co 46
Fibre Conduit Co 75
Firestone Tire & Rubber Co 51
Flood, Walter H 77
Flower-Stephens Mfg. Co 25
Ford Meter Box Co 35
Framingham Nursery Co 73
Fuller & McClintock 77

Gadsden Pipe Co 21
Gage, Benj. E 60
Gamewell Fire Alarm T Co 58
Gannett, Seelye & Fleming 77
Garford Motor Truck Co 57
General Electric Co 2-61
General Filtration Co 26
General Motors Truck Co 46
George, Howard 56
Goodrich Rubber Co., B. F 6-7
Good Roads Co 54
Good Roads Mach'y. Co 91
Great Western Electro Chem. Co 30
Greeley, Samuel A 77
Gregory, John H 78

Haines, Jones & Cadbury Co 21
Hansen, A. F 78
Harding James 78
Hare & Hare 78
Harrison Nursery Co 73
Hazen, Whipple & Fuller 78
Helder, Arthur H 78
Hering, Rudolph 78
Hersey Manufacturing Co 22
Hicks Nurseries 74
Higgins, J. Wallace 78
Hill-Standard Co 62
Holophane Glass Co., Inc 42
Hopkins, Chas. C 78
Horvath, M. H 78
Hunt & Co., Robert W 79

Ideal Ventilator Co 76

Jacobs, J. L 78
Jaeger Machine Co 83
Jennings, Lawrence & Lindsey 78
Johnson Co., J. D 21
Johnson, Geo A 78

Kimberly, A. Elliot 78
King Foundry Co 79
Kittredge, H. C 78
Knowles, Morris 78
Kohankie & Son, Henry 74
Koiesch & Co 87
Krupp Foundry Co 21

Leadite Co., The 26
Leavitt, Chas. W 78
Lewis & Valentine 74
Littleford Bros 85
Loper Fire Alarm Co 59
Ludlow, J. L 78
Ludlow Valve Mfg. Co 26
Lynchburg Fdry. Co 22

Manufacturers Dist. Co 75
Marchant Calculating Machine Co. 53
Martinique Hotel 60a
Medina Foundry Co 21
Meehan Co., Thos. B 72
Meehan, Thos., & Sons 78
Metropolitan Paving Brick Co., The 55
Minwax Co 25
Mitchell, Hugh C 78
Modern Iron Works 30
Mott Iron Works, J. L 53

National Pipe & Foundry Co 21
National Water Main Cleaning Co. 32
Neptune Meter Co 14-15
Newport Culvert Co 89
N. Y. Contin'l Jewell Filtration Co. 30

Noiseless Typewriter Co .....
Noll Bros .....
Norwood Engineering Co .....
Nutter, Frank H .....

Otterson Auto-Eductor Co .....

Packard Motor Car Co .....
Pennsylvania Cement Co 1
Pennsylvania Lawn Mower Works .....
Pennsylvania Salt Mfg. Co .....
Pioneer Asphalt Co .....
Pitometer Co .....
Pittsburgh Filter Mfg. Co .....
Pittsburgh Meter Co .....
Pollock & Taber .....
Potter, Alexander .....
Potts, Clyde .....
Pratt & Cady Co., Inc .....

Ransome-Leach Co .....
Reading Foundry & Supply Co .....
Rensselaer Valve Co .....
Republic Rubber Co .....
Rigamount, Victor A .....
Rochester Can Co .....
Rundle-Spence Mfg. Co .....
Russell Grader Mfg. Co .....

Salem Brass & Iron Mfg. Co .....
Sanitary Co. of America .....
Schuylkill Valley Vit. Prod. Co .....
Scofield Engineering Co .....
Semet-Solvay Co .....
S. E. T. Valve & Hydrant Co.
Sewer Pipe Mfrs. Assn .....
Shawnee Mower Co .....
Sherman, LeRoy K .....
Shone Co .....
Simplex Wire & Cable Co .....
Smith Co., W. & T .....
Somerville Iron Works, The .....
Sonneborn Sons, Inc., L 6
South Bend Motor Car Works .....
Southern Clay Mfg. Co .....
Spaulding Mfg. Co .....
Spray Engineering Co .....
Standard Foundry Co .....
Standard Oil Co .....
Stander, Louis E .....
Steel Basket Co .....
Sterling Motor Truck Co .....
Stewart Iron Works Co .....
Storms Mfg. Co .....
Storrs & Harrison Co .....
Superior Mfg. Co .....
Survey, The .....

Taylor Portable Steel Derrick Co .....
Thomson Meter Co .....
Thorburn & Co., J. M .....
Townsend & Co., S. P .....
Tracy, L. D .....
Trussed Concrete Steel Co .....
Turbine Sewer Mch. Co .....
Twogood, L. Scott .....

Union Foundry Co .....
Union Iron Products Co .....
Union Water Meter Co .....
United Lead Co .....
U. S. Cast Iron Pipe & Foundry Co.
United States Tire Co .....
Universal Road Machinery Co .....
Utilities Engineering Co .....

Wallace & Tiernan Co. Inc .....
Warren, Engineering Co .....
Warren Bros. Co .....
Warren Foundry & Machine Co .....
Washtenaw Engineering Co .....
Water Works Equipment Co .....
Watson Wagon Co .....
Weiskittel & Son Co., A .....
Westinghouse Elec. & Mfg. Co .....
Wetter Mfg. Co., H .....
White Co., The .....
Wiley & Sons, John .....
Wolff, Mark .....
Wood & Co., R. D .....
Worthington Pump and Mch Corp.
Wright Wire Co .....

Zelnicker Supply Co., W. A .....

GUARDIANS

Danger! Steer Clear!

That's what the Cutter Traffic Post means to all who drive. Just as the lighthouse sends a warning light for pilots to steer clear of the rocks and dangerous points, so the Cutter Traffic Post is a signal to all who drive to look out for dangerous corners.

Like the lighthouse, the Cutter Post stands guard every day in the year and prevents scores of accidents. A Cutter Traffic Post placed in the centre of intersecting streets will quickly reduce traffic tangles and their usual mishaps. The ruby red globe stands out in the darkest night, commands attention instantly and enforces the familiar but often unheeded rule, "Keep to the right."

The Cutter Post is in use in many cities where once the traffic problems caused no little annoyance to both officials and citizens. The Cutter Traffic Post will solve your traffic troubles.

Write for detailed information, also catalog illustrating our complete line of lighting fixtures.

George Cutter Company

413 Notre Dame Street, South Bend, Ind.

CHICAGO DETROIT NEW YORK
LOS ANGELES SAN FRANCISCO SEATTLE

Tarvia Roads Withstand Severe War Traffic—

THE troops in their Texan maneuvers last year ruined many miles of ordinary roads. Some roads, however, stood the test. *These were Tarvia Roads.*

They stood the strain of marching thousands. Horse, motor, and artillery divisions passed over them without number.

They had the equivalent of years of traffic in a few days.

The road commissioners were so well pleased with the way the Tarvia Roads withstood this severe traffic that they immediately ordered the construction of several additional miles in Travis County alone.

Tarvia Roads are built to withstand hard usage. It is for this reason that they are in use on Government reservations, in the Army cantonments. Hundreds of the most important state and county thoroughfares all over the country are Tarvia Roads. Today, owing to the great traffic-congestion and the increasing cost of living, the country needs good roads more than ever before.

Poor roads add to the cost of everything we buy because they add to the cost of every ton that drags its weary weight over them.

Good roads, on the other hand, pay for themselves over and over again in decreased hauling charges and by saving wear and tear on vehicles and motor-cars.

The cheapest form of good road construction today is Tarvia Roads, because their first cost is low and no form of road construction is so inexpensive to maintain.

(Top)—Troop movement over Tarvia-treated Government post-road in Travis County, Texas.

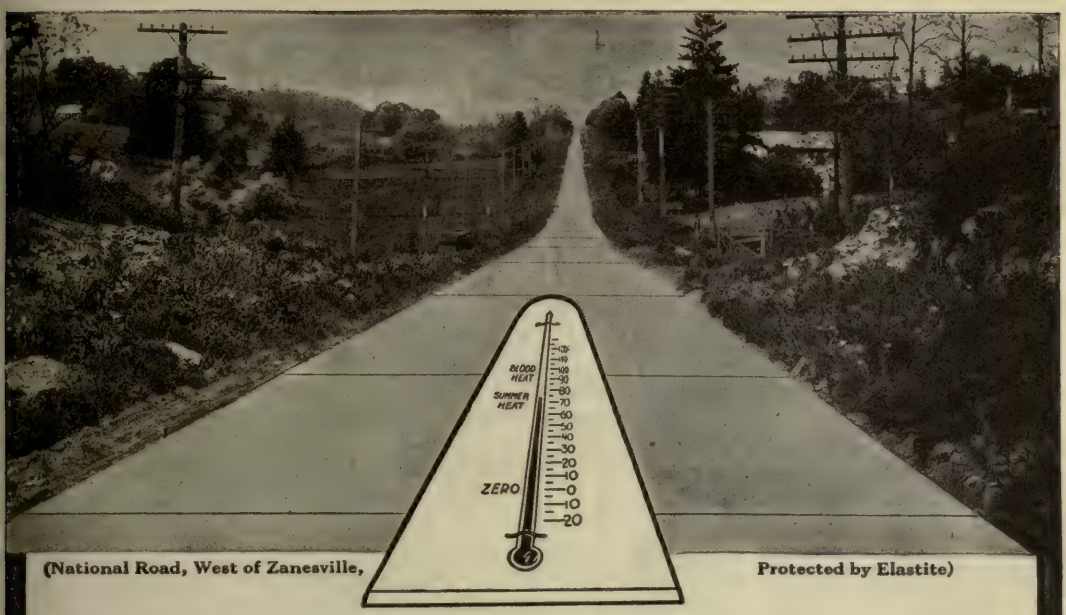
(Bottom)—Entrance road to Naval Station at Great Lakes, Illinois. All main roads within the Station are built with Tarvia.

Write to the Tarvia Special Service Department and they will give you expert and practical information and suggestions regarding the best method of getting good roads in your community.

There are several grades of Tarvia and a dozen methods of using the product to meet varying road conditions.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis Nashville
Salt Lake City Seattle Peoria
THE BARRETT COMPANY, LIMITED
Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.



(National Road, West of Zanesville, Protected by Elastite)

Roads Register Temperature
just like mercury by expansion and contraction

If there were no free space for expansion the mercury tube would burst.

CAREY
Elastite
EXPANSION JOINT
Name Reg. U.S. Patent Office

Protects Roads from Bursting in Summer or Cracking in Winter

IT AFFORDS ample, constant and dependable road expansion space.

The exceptional superiority of Elastite lies in the fact that the asphalt strips remain elastic year in and year out, and wear as long as the road itself.

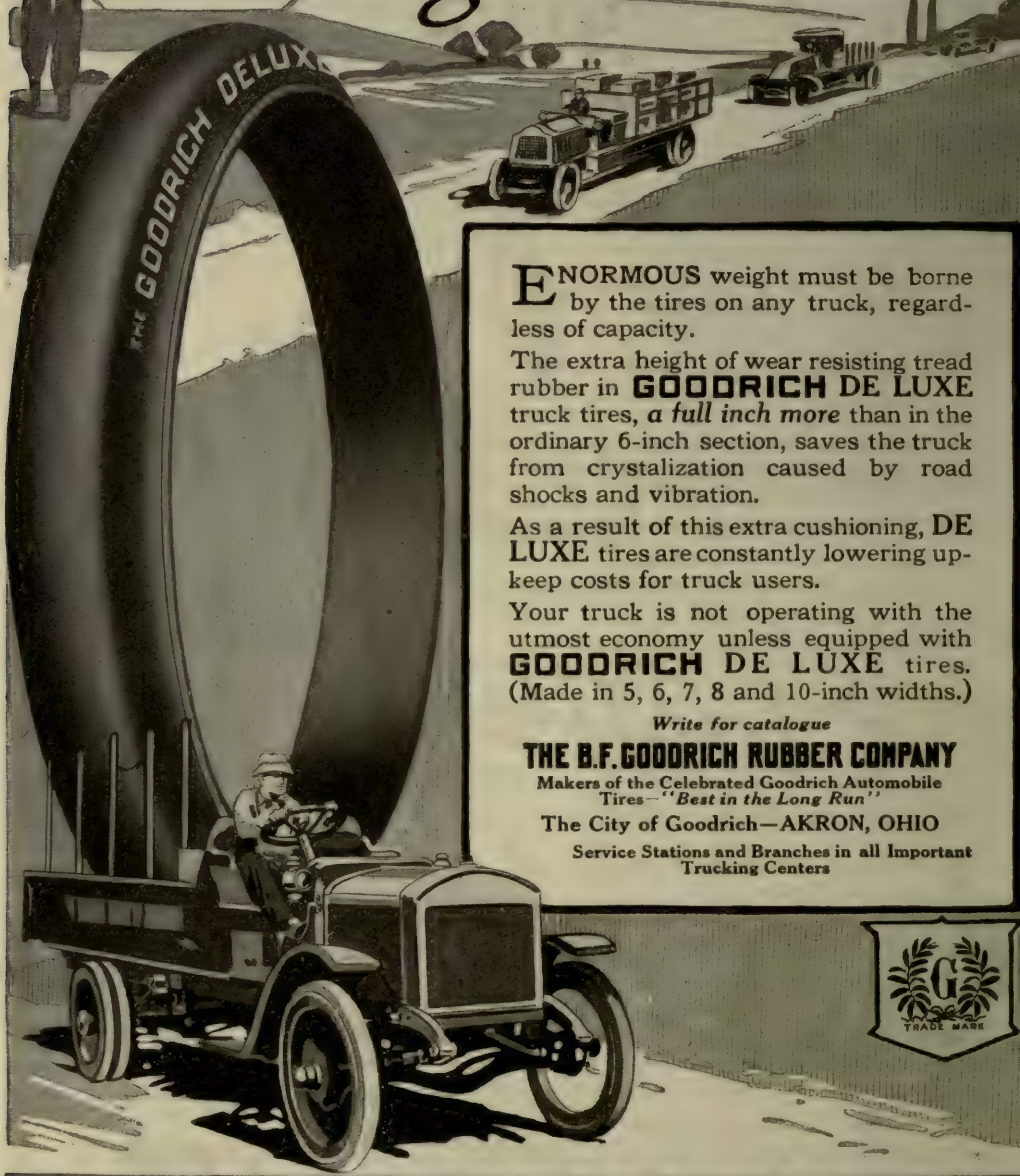
The asphalt compound does not melt and run away in summer. It does not become brittle in winter. On the contrary it sticks to the pavement, maintaining a frost tight seal and stretching to fill the joint when the paving contracts.

In addition to lasting longer and serving better Elastite is easily installed. One man can place the ready-made strips and keep ahead of the pavers. Eliminates tar kettle gang. Let us send you literature telling more about Elastite and where it is protecting prominent pavements.

THE PHILIP CAREY COMPANY

8 Wayne Ave., Lockland. - - Cincinnati, Ohio

Saving the World's Largest Motor Truck Fleets



ENORMOUS weight must be borne by the tires on any truck, regardless of capacity.

The extra height of wear resisting tread rubber in **GOODRICH** DE LUXE truck tires, *a full inch more* than in the ordinary 6-inch section, saves the truck from crystalization caused by road shocks and vibration.

As a result of this extra cushioning, DE LUXE tires are constantly lowering upkeep costs for truck users.

Your truck is not operating with the utmost economy unless equipped with **GOODRICH** DE LUXE tires. (Made in 5, 6, 7, 8 and 10-inch widths.)

Write for catalogue

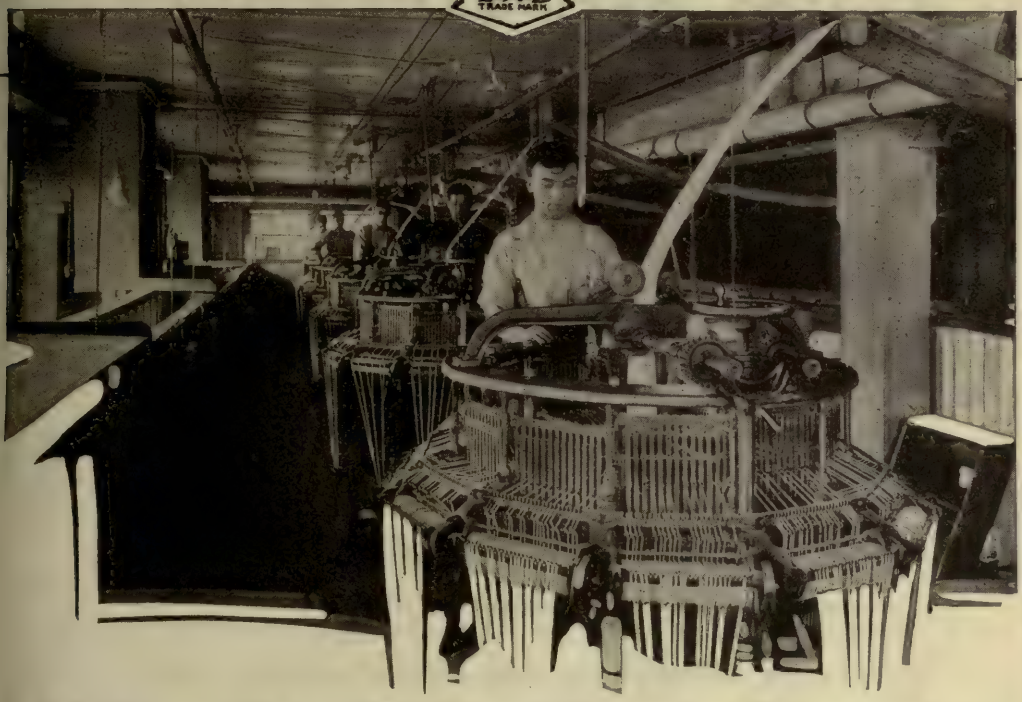
THE B.F. GOODRICH RUBBER COMPANY

Makers of the Celebrated Goodrich Automobile Tires—*"Best in the Long Run"*

The City of Goodrich—AKRON, OHIO

Service Stations and Branches in all Important Trucking Centers

GOODRICH
MOTOR TRUCK TIRES



Medium Priced—Long Lived—Distinctive

"WHITE KING"
FIRE HOSE

eventually is the choice of the fire chief who is conscientiously searching for true quality.

Because—

There is not a better, more dependable cotton jacketed Fire Hose on the market today—*regardless of type, style or price* than "WHITE KING." This guarantee is embodied in every bid.

Thousands of fire chiefs, from coast to coast, know it—and a torrent of re-orders prove it.

Let "WHITE KING" prove itself to you.

THE B.F. GOODRICH RUBBER COMPANY

Makers of the Celebrated Goodrich Automobile Tires—
"Best in the Long Run"

Akron, Ohio—The City of Goodrich

What are You Doing

The big business men of our country realize that the *big business* of our country now is to *win the war.*

To that end every other business must be subordinated.

The sacrifice of those at home must equal the service of those "over there."

Personal comfort must give way to conservation for the general good.

In no other way can our country merit the fruits of a successful war on autocracy.

The Cast Iron Pipe

1 Broadway,

to Help Win the War?

It has been said that "this war on autocracy has resolved itself into a war on waste."

"Thrift," then, must become our watchword and enter into every act of expenditure whether for private or public interest.

This applies as forcefully to expenditures for pipe as for provisions—buy only what is necessary and only that kind which will best serve your purpose.

But in the matter of pipe, "thrift" is best exercised by the selection of that which will also give the *longest* service.

Publicity Bureau

New York

EVERWEAR

MAKE PLAYGROUNDS OUT OF THOSE EMPTY LOTS!

Springtime is coming and the "kids" will want to get out in the open once more. Where will the children of your town play and enjoy themselves? In the streets? In the empty lots? Or will you provide healthful, spacious playgrounds for them?

Let them have all the fun and exercise they can get while they're young. Help them to develop deep chests and broad shoulders. Playgrounds will do it, and it doesn't cost much. Furnish us data on your ground spaces and we will cheerfully send you plans and prices without you incurring any obligation.

THE EVERWEAR MANUFACTURING CO.
Springfield, Ohio

EVERWEAR
STANDS WEAR AND TEAR

EQUIPMENT

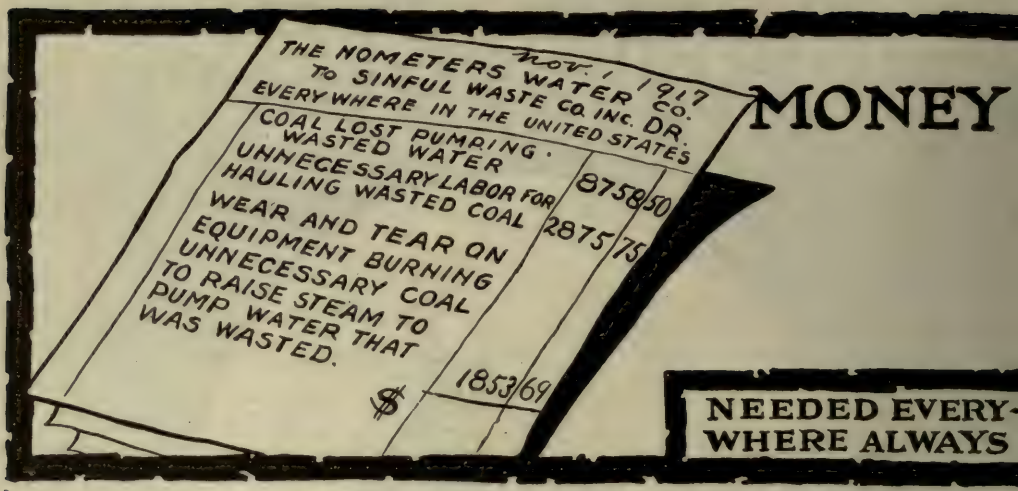
EQUIP THEM WITH EVERWEAR APPARATUS!

The *children are safe* on Everwear apparatus, because every detail of construction is planned to safeguard them. And *you are safe* in purchasing Everwear because it is built of the highest grade materials and by expert workmen. For durability it has no peer. All equipment is carefully inspected and tested and shipped *direct* from *maker* to *user*. Equipment at a minimum cost embodying maximum efficiency.

Write for free catalog describing and picturing our complete line of the latest and approved playground equipment. And don't forget—*More Playgrounds make fewer Plaguegrounds.*

THE EVERWEAR MANUFACTURING CO.
Springfield, Ohio

EVERWEAR
STANDS WEAR AND TEAR



Are You Going to Waste Money This Year?

The Answer is "Water Meters"

Would you like us to tell you which water meter we believe to be the best money saver for you?

NEPTUNE METER COMPANY
50 EAST 42nd STREET, NEW YORK
CHICAGO · BOSTON · SANFRANCISCO
ATLANTA · LOS ANGELES · PORTLAND · SEATTLE
CINCINNATI

Are You Going to Waste Coal This Year?

Let us hope not.

If you would like some interesting booklets telling how water meters save coal, just send us your address.

NEPTUNE METER COMPANY
50 EAST 42nd STREET, NEW YORK
CHICAGO · BOSTON · SANFRANCISCO
ATLANTA · LOS ANGELES · PORTLAND · SEATTLE
CINCINNATI

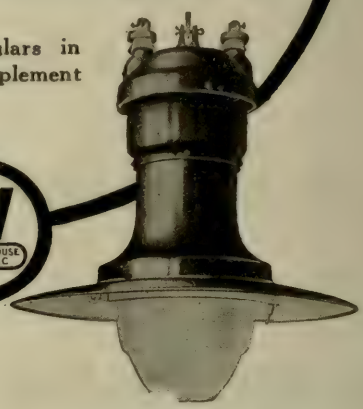
Westinghouse

Type CI (Cast Iron) Luxsolite Fixtures For Mazda C Lamps

The cast-iron case makes them particularly adapted for the hard service required of street-lighting fixtures—the cast-iron case cannot be dented. The cast-iron, galvanized case is finished with black asphaltum paint. Such fixtures installed under the most severe climatic conditions, have given four years of service without showing any appreciable deterioration. The cases are very convenient to disassemble, sherardized bolts being used throughout. The overall weight of the fixture has been kept well under that of standard arc lamps, so no difficulty is experienced in the use of the same line equipment with Type CI Luxsolite Fixtures.

Full particulars in Catalog Supplement 7-A

Type CI Fixture with Reflecter and Large Globe



Type CI Fixture with Reflector and Holophane Skirted Refractor

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.

CONCRETE FOR PERMANENCE

Speed up the Sinews of War

The recent trip of army motor trucks from the middle west to Washington proclaimed the necessity for concrete roads!

Every city, town and village should be the connecting link for continuous concrete roads—to help the government and itself.

They can be quickly built, are cheapest in the end—cost only about $30 per mile per year to maintain, and they last!— there are many over 20 years old, and still good.

Atlas Road Building Service—plans and proposals, approximate costs, and inspection if desirable—at your disposal. Write for "Concrete Highway Construction."

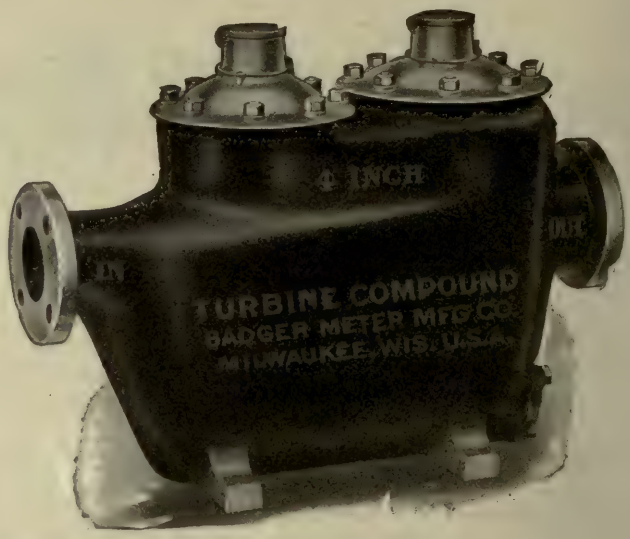
The Atlas Portland Cement Company

Member of the Portland Cement Association

30 Broad Street, New York — Corn Exchange Bank Bldg., Chicago
Philadelphia Boston — St. Louis Minneapolis
Des Moines Dayton Savannah

PORTLAND
ATLAS CEMENT
The Standard by which all other makes are measured"

The Meter that gives absolute satisfaction is the BADGER



THE BADGER

Gives Most Service and Least Trouble

The water meter that will keep accurate records and give the most service with little trouble and maintenance expense is the Badger Meter.

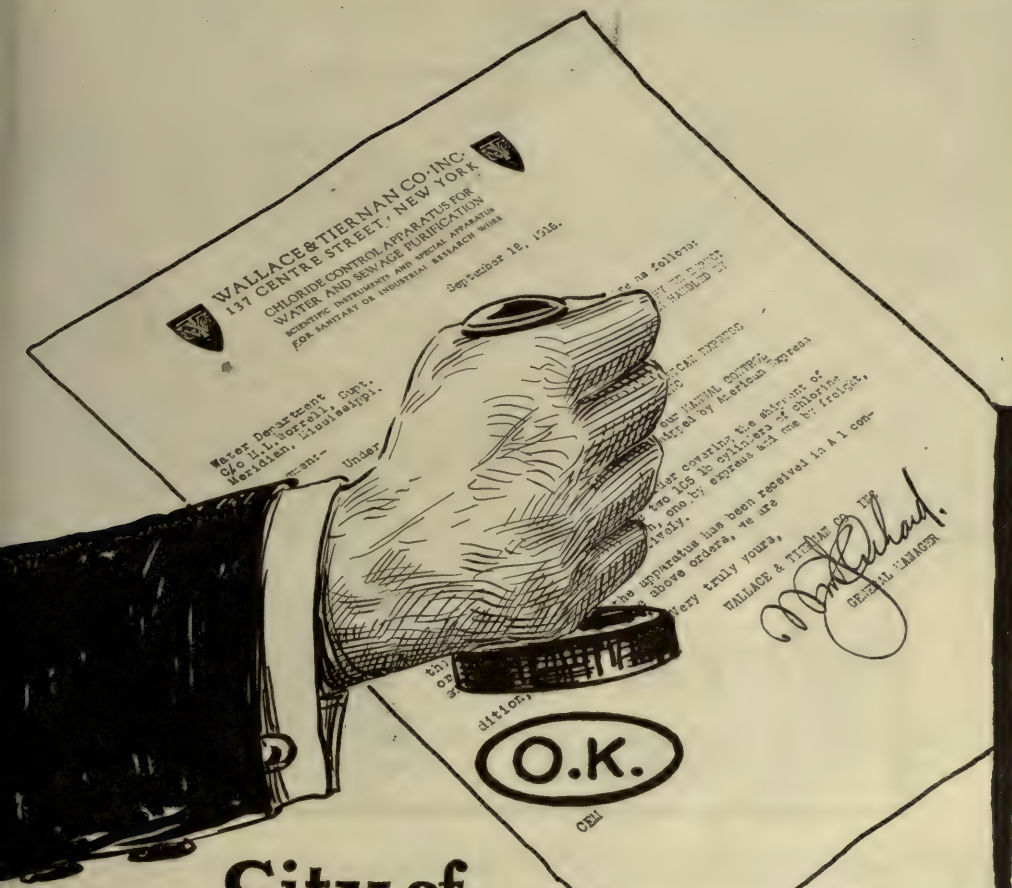
Perfect workmanship and excellent finish are characteristic of all Badger Meters.

Every Badger Meter is carefully tested by actual operation before it is sent forth with our binding guarantee for accuracy.

No test is considered satisfactory until the meter has properly recorded on both large and small flows.

Upon receipt of your name and address, a neat little booklet on water meters will be sent you free.

The Badger Meter Mfg. Co.
MILWAUKEE, WIS.



City of MERIDIAN, Miss.

Water Department

Oct. 31, 1917.

"Our W. & T. Apparatus is working as beautifully as you have ever seen and we are very well satisfied indeed with our investment.

"To us it is peculiarly gratifying that the U. S. Public Health Service report that we are getting practically sterile water and are only using .16 of one part of chlorine to one million parts of water."

WATER DEPARTMENT, City of Meridian, Miss.

Meridian's O.K. is without qualification

and reflects similar experiences of more than 500 municipalities, large and small, where W. & T. Chlorinating equipment has been installed for water and sewage purification.

Is your City or Town as satisfactorily protected against epidemics of water-borne disease?

No water supply is absolutely safe unless it has been sterilized. Liquid Chlorine is a 100 per cent. efficient sterilizing agent. **W. & T. Apparatus for Chlorine Control has attained an enviable reputation for unfailing *reliability, economy,* and *permanency*—the STANDARD CHLORINATOR.**

Send for Booklet with interesting data

WALLACE & TIERNAN CO., INC., 137 Centre Street, New York

Canadian Representatives
THE GENERAL SUPPLY COMPANY OF CANADA
Ottawa, Montreal, Toronto, Winnipeg

Chicago Office:
People's Gas Building

Pacific Coast Representative
KENNETH SHIBLEY
Merchants' Exchange Building
San Francisco, Cal.

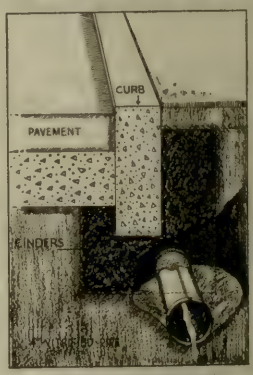
jăck, *n.*, an implement for lifting.
frŏst, *v. t.*, to injure by freezing.

Jack Frost

HE is the rascal who ruined this new pavement, lifting it and heavi it until a large section of splendid highway was an impassible rui Wherever drainage is neglected, as it is on thousands of otherwise fi highway improvements, this is the result.

Vitrified Clay Pipe
"THE PERMANENT PIPE"

Solves question of the moist sub-bed, which is the seat of three-quarters of the serious pavement difficulties. Highway authorities, who differ on every other question, agree in demanding better drainage. Better drainage means Vitrified Pipe drainage. Abolish moist sub-beds and dangerous, ill-smelling side ditches. Drain with Vitrified Pipe.



THE REMEDY
Vitrified Pipe Drainage

THE SEWER PIPE MANUFACTURERS ASSOCIATION

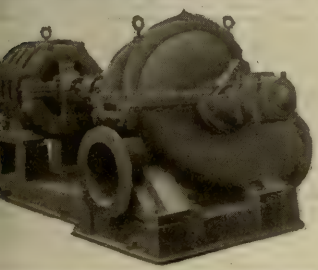
JOHN L. RICE
FIELD COMMISSIONER

SECOND NATIONAL BI
AKRON, OHIO

WORTHINGTON

big line to choose from—a safe line to choose

WORTHINGTON
CENTRIFUGAL PUMPS



Increased efficiency and lower coal costs

The fuel crisis furnishes to water works men a sharp reminder to cut every form of waste and inefficiency.

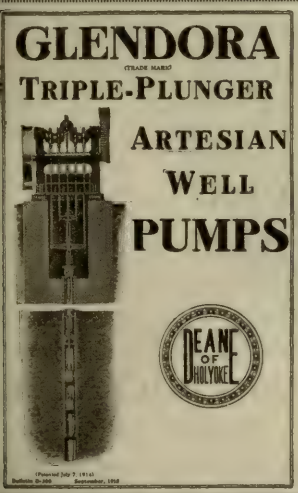
The Municipalities whose water works consist of Worthington Pumps find in the midst of the present coal crisis, at least the one satisfying element that their pumping equipment is operating with the highest economy of fuel and upkeep.

Bulletins covering any or all types of pumps, sent on request.

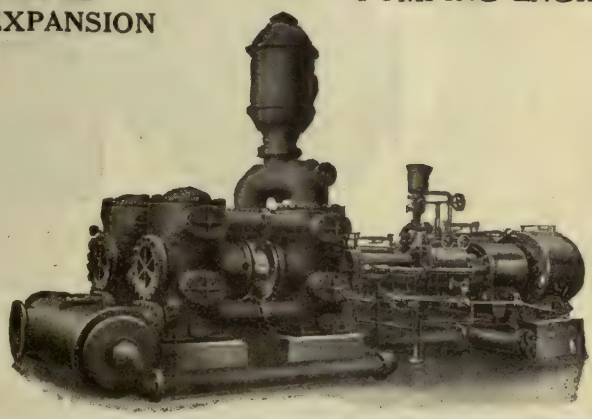
WORTHINGTON PUMP AND MACHINERY CORPORATION

115 BROADWAY, NEW YORK

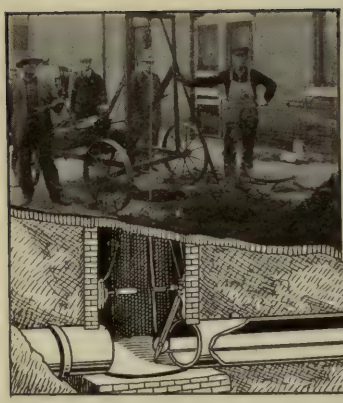
Branch Offices in all Principal Cities. I 55.8



WORTHINGTON TRIPLE EXPANSION WATER WORKS PUMPING ENGINE



WATER WORKS PUMPS



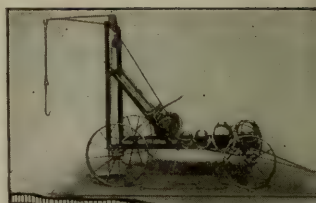
SEWER CLEANING MACHINERY

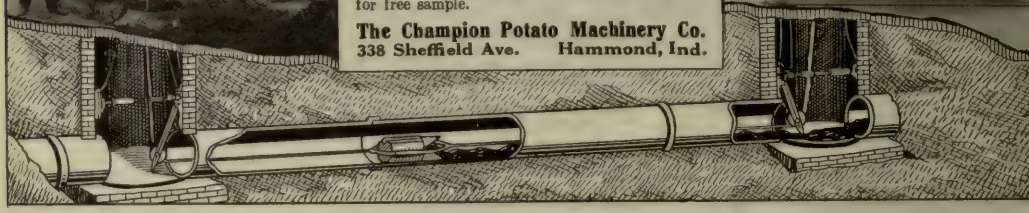
The Kuhlman Sewer Cleaning Apparatus will clear any sewer of dirt, gravel, sand, cinders, rags, paper, tar or practically anything.

It does the work quickly and cheaply. It's a great time and money saver. It is being utilized by scores of progressive municipalities all over the country.

Write at once for prices and other interesting information. We also make sewer rods. Send for free sample.

The Champion Potato Machinery Co.
338 Sheffield Ave. Hammond, Ind.





AMERICAN CAST IRON PIPE CO.

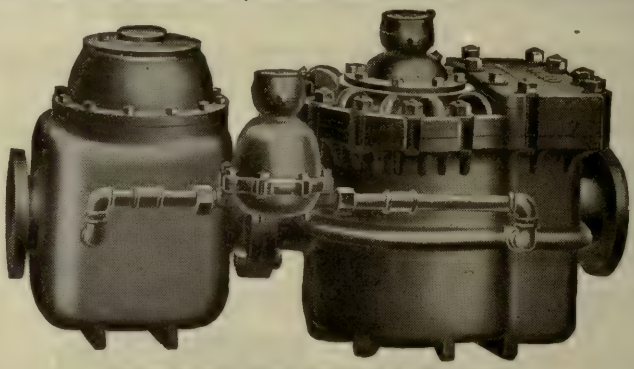
MANUFACTURERS OF CAST IRON PIPE & FITTINGS BIRMINGHAM, ALA.

SALES OFFICES
Birmingham, Ala., Box 908
Columbus, Ohio, 607 New Hayden Bldg.
Minneapolis, Minn., 712 Plymouth Bldg.
New York City, No. 1 Broadway
Chicago, Ill., 512 1st National Bank Bldg.
Dallas, Tex., 1217 Praetorian Bldg.
Kansas City, Mo., 716 Scarritt Bldg.
San Francisco, Cal., 711 Balboa Bldg.

LYNCHBURG FOUNDRY COMPANY

CAST IRON PIPE AND FITTINGS — Bell and Spigot and Flanged

GENERAL SALES OFFICE: Peoples Gas Building, CHICAGO, ILL.



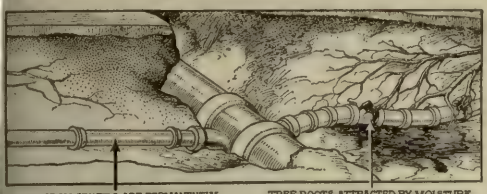
Compounding Valve Attached to Nilo Meter

The Union Compounding Valve Makes it Possible for any Large Meter to Register the Trickle as well as the Rush.

Simply take the valve and the small meter and attach them to the large meter, and you have an accurate and simple compound meter at a remarkably low cost.

Write for further information.

UNION WATER METER CO.
WORCESTER, MASS.



Choked and disintegrated by twisted masses of root growth, Cheap Pipe House Sewers and Drains discharge sewage into subsoil and cellar and seriously affect the health of those living above.

The One Way to Keep Tree Roots From Destroying House Sewers—

USE CAST IRON SOIL PIPE

Cast Iron Soil Pipe, unaffected by tree roots and disintegrating forces will give permanently tight and unfailing sewage lines eliminating unsanitary conditions for all time. It is recommended by its history.

Specifications and illustrated literature will be mailed upon request by any or all of the following independent and competing makers of Cast Iron Soil Pipe and Fittings.

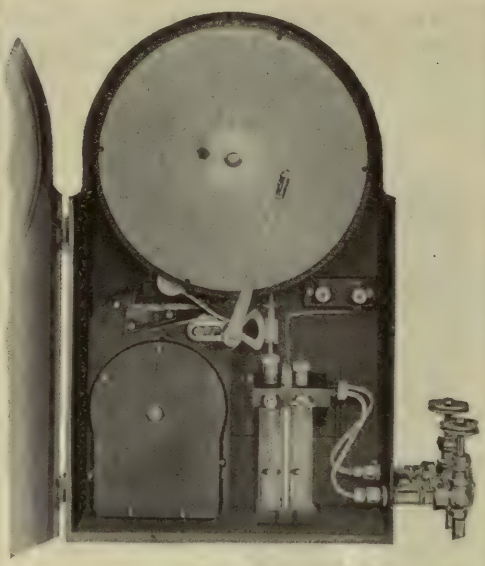
Superior Mfg. Co. - - - Bessemer, Ala.
Union Foundry Co. - - - Anniston, Ala.
Weiskittel & Son Co., A. - Baltimore, Md.
Wetter Mfg. Co., H. - - Memphis, Tenn.
Abendroth Brothers - - Port Chester, N. Y.
Alabama Pipe & Foundry Co. - Anniston, Ala.
American Foundry & Pipe Co. - Penns Sta., Pa.
Anniston Foundry Co. - - Anniston, Ala.
Bessemer Soil Pipe Co. - - Bessemer, Ala.
Campbell Mfg. Co. - - - - Gadsden, Ala.
Casey-Hedges Co., The - Chattanooga, Tenn.
Central Foundry Co. - - New York, N. Y.
Charlotte Pipe & Foundry Co. - Charlotte, N. C.
Coosa Pipe & Foundry Co. - Birmingham, Ala.
Crown Pipe & Foundry Co. - - Jackson, Ohio
Gadsden Pipe Co. - - - Gadsden, Ala.
Haines, Jones & Cadbury Co. - Philadelphia, Pa.
Johnson Co., J. D. - - - New York, N. Y.
Krupp Foundry Co. - - - Lansdale, Pa.
Medina Foundry Co. - - - Medina, N. Y.
National Foundry Co. of N. Y., Inc., Brooklyn, N. Y.
National Pipe & Foundry Co. - - Attalla, Ala.
Reading Foundry & Supply Co. - Reading, Pa.
Salem Brass & Iron Mfg. Co. - - Salem, N. J.
Sanitary Co. of America - - - Linfield, Pa.
Somerville Iron Works - - New York, N. Y.
Standard Foundry Co. - - - Anniston, Ala.

IN THE BUILDING
UNDER THE GROUND

Write today and learn why

Cast Iron Soil Pipe Should Be Used in All House Drainage

A-1039



The MANOGRAPH—
SIMPLE and ACCURATE

The MANOGRAPH is the only pitot recorder in which there are no complicated or invisible working parts.

Open the door and all working parts are exposed for inspection.

No springs, floats, diaphragms, cams, cables or other complicated and delicate mechanisms to get out of adjustment.

The MANOGRAPH may be checked and corrected for accuracy instantaneously.

These features are exclusive and make the MANOGRAPH the simplest and most accurate of all pitot recorders.

A bulletin descriptive of the MANOGRAPH may be obtained from

Water Works Equipment Co.
50 Church Street New York City

MATHIESON ALKALI WORKS, Inc.
Niagara Falls, N. Y.

Castner Electrolytic Process
Eagle-Thistle Brand

CHLORIDE OF LIME

In 200, 450 and 750-lb. drums Strongest, quickest-settling, most reliable.

LIQUID CHLORINE

Pure anhydrous, for use with any control apparatus. In improved and convenient cylinders, 105 and 150 lbs. net.

ARNOLD, HOFFMAN & CO., Inc.
Sole Agents

Boston 61 Broadway Philadelphia
Providence New York Charlotte, N. C.

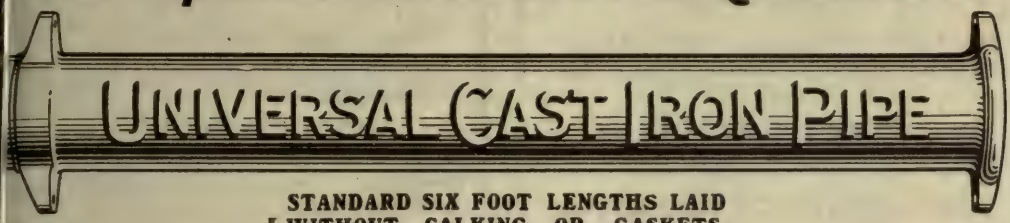
APPROVAL
HERSEY DETECTOR METER

The Hersey Detector Meter has been accepted for eleven years in 3", 4", 6", 8", 10" and 12" sizes without any restrictions or conditions of any kind by every Insurance Company, Stock and Mutual, doing business in the United States, and by the Water Departments and Water Companies in more than 500 Cities and Towns for use on over 3,000 Fire Services protecting nearly $2,000,000,000 worth of Insured Property

HERSEY MANUFACTURING COMPANY

BOSTON COLUMBUS, O. SAN FRANCISCO
NEW YORK PHILADELPHIA LOS ANGELES
CHICAGO ATLANTA PORTLAND, ORE.

The Pipe that Answers All Questions



STANDARD SIX FOOT LENGTHS LAID WITHOUT CALKING OR GASKETS.

BECAUSE——————

That is why
it is used for—

WATER
GAS
SEWAGE DISPOSAL
SUCTION
OIL DISTILLATION
REFRIGERATION
LOW-PRESSURE STEAM
CENTRAL STATION HEATING
DYE AND ACID DRAINS

-and all other classes of service—in buildings—under ground.

CAST IRON PIPE is the pipe of long life—THE PIPE EVERLASTING.

CAST IRON PIPE with the UNIVERSAL JOINT STAYS when other pipe and other joints leak.

Tested and approved for Fire Protection Service by the National Board of Fire Underwriters.

Wrenches the Only Equipment

—no packing
—no calking
—no gaskets

UNIVERSAL PIPE can be laid anywhere—at any time—under any conditions.

CORRESPONDENCE INVITED.

CENTRAL FOUNDRY COMPANY

CHICAGO
DALLAS

NEW YORK
90 West Street

ATLANTA
SAN FRANCISCO

U-246

Trade **LEADITE** *Mark*

Registered U. S. Patent Office

For Jointing Cast Iron Water Mains

NO CAULKING required

Saves 50% to 65%

Write for information and price

THE LEADITE COMPANY, Inc.

100 S. Broad Street Philadelphia, Pa.

SECURITY SEWER RODS

Send for Flyer No. 20

Three-foot Rods, 65 cents each

Four-foot Rods, 75 cents each

They cannot buckle or uncou pl in the duct

Security Rods are made fro second growth hickory, wit malleable iron coupling swedged or shrunk down ver tightly on to the curve places at end of sticks. S curity couplings canno come off.

Joint and unjoint easil and quickly—light weight— long runs easily made. N slack but lend themselves t all practical bends.

F. BISSELL COMPANY, 226-228-230 Huron Stree Toledo, Ohio

SLUICE GATES, CHECK VALVES, AIR VALVES, INDICATOR POSTS, ETC.

GATE VALVES **EDDY** FIRE HYDRANTS

Hydraulically and Electrically Operated Valves and Sluice Gates. Valves Designed For All Kinds of Service.

EDDY VALVE COMPANY, WATERFORD, N. Y.

New York Chicago Boston San Francisco Philadelphia

COLUMBIAN IRON WORKS

CHATTANOOGA, TENN.

Manufacturers of Fire Hydrants, Valves, Valve Boxes, Sluice Gates, Meter Boxes and Water Works Supplies

ESTIMATES PROMPTLY FURNISHED

DRY FEED

for

COAGULANT

application in

Filter Plants

Economizes space, Labor, Installation cost; Increases efficiency.

PITTSBURGH FILTER MFG. CO.

Kansas City, Mo. Pittsburgh, Pa.

FIRE HYDRANTS

Frost-Proof

Simple-Efficient

All parts removable without digging up hydrant. Special device prevents street from being flooded should stand pipe be broken. Minimum expense to install and maintain.

LUDLOW

GATE VALVES

FOR

Water, Steam Gas, Oil, Hydraulic or Electric Operated

All styles, any size, all pressures

- - THE - -

Ludlow Valve Mfg. Co.

TROY, N. Y.

Branch Offices

New York Chicago Boston Philadelphia Pittsburg Kansas City

TRADE MINWAX MARK

THE PERMANENT
WATERPROOFING

Used on notable municipal works the country over. Send for the "Minwax" Bulletins describing waterproofing and protective products for every purpose.

THE MINWAX COMPANY, Inc.
18 EAST 41st STREET NEW YORK

Manufacturers of CAST IRON PIPE

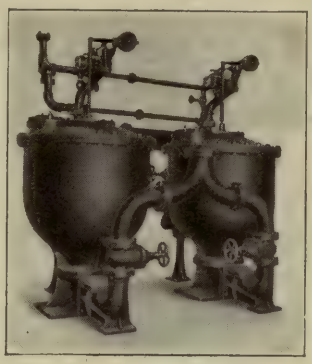
for WATER—GAS—CULVERTS—SEWERS

Special Castings:-Also Flexible Joint Pipe-Cylinders-Tubes, Milled and Plain Ends-High Pressure Fire Service Pipe.

"Quality and Service Guaranteed"

WARREN FOUNDRY & MACHINE CO

Sales Offices: 11 Broadway, N.Y. 201 Devonshire St., Boston, Mass.
Works: Phillipsburg, N. J.



SHONE EJECTORS

Have been used for handling sewage in municipal sewerage systems and city buildings in all parts of the world for over 35 years. Installation made in Chicago Auditorium in 1888 still giving perfect service.

Unequalled for reliability, economy and durability; absolutely non-clogging; no screens required; automatic and odorless.

SHONE COMPANY
225 Institute Pl., Chicago

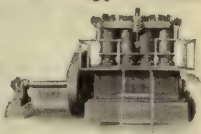
Send for Bulletin P-4000

NEW YORK CHICAGO
Keystone and Eureka
Water Meters
Pittsburgh Meter Co.
East Pittsburgh, Pa.
LOS ANGELES SEATTLE
COLUMBIA, S.C. KANSAS CITY

CONSERVE YOUR FUEL

The conservation of fuel is now more than an economic advantage—it is an essential factor in meeting present national and industrial requirements.

GAS POWER is universally recognized as the cheapest form of power available, as well as the best for many kinds of service.



Bruce-Macbeth gas power plants operate on either gas or coal.

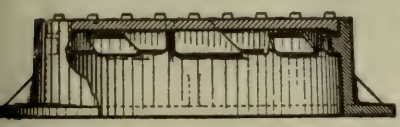
THE BRUCE-MACBETH ENGINE COMPANY
2137 Centre St., N. W., Cleveland

BRUCE-MACBETH GAS ENGINES

P&C CO. VALVES & HYDRANTS P&C CO.

of UNUSUAL QUALITY — for UNUSUAL SERVICE

Pratt & Cady Co., Inc. Write for Catalogue Hartford, Conn.



WM. E. DEE COMPANY
80 N. La Salle Street Chicago, Ill.

We manufacture Manhole, Catch Basin and Sewerage Castings of all Kinds. We make anything in Gray Iron. Write for our prices.

DEMING POWER PUMPS
For Municipal Service

The illustration represents the municipal pump house at Dickinson, N. D. A Deming Power Pump in this house, forces the water to an elevated tank, where it is constantly available for domestic needs and fire protection.

In hundreds of municipalities throughout the country, may be found pump houses like this with a Deming Power Pump or Deep Well Head inside. If your town is interested in pumping equipment, send for our 192-page Power Pump Catalogue "J." Municipal officials may have it on request.

THE DEMING COMPANY, Salem, Ohio

HAND AND POWER PUMPS FOR ALL USES

GENERAL DISTRIBUTING HOUSES:

Chicago: Henion & Hubbell.
Pittsburgh: Harris Pump & Supply Co.
New York: Ralph B. Carter Co.
Buffalo: Root, Neal & Co.
Boston: Chas. J. Jager Co.
Richmond: Sydnor Pump & Well Co.
Philadelphia: W. P. Dallett.
Denver: Hendrie & Bolthoff Mfg & Sup. Co.
San Francisco: Simonds Machinery Co.
Charlotte, N. C.: Realty Building.
Houston, Tex.: H. A. Paine.
Agencies in all principal cities.

"RENSSELAER" VALVES
All Sizes All Pressures All Purposes

"COREY" FIRE HYDRANTS
Valve Boxes Indicator Posts Air Valves

RENSSELAER VALVE CO.

General Offices, TROY, N. Y.

NEW YORK, Hudson Term. Bldg. CHICAGO, Monadnock Block PITTSBURGH, Oliver Bldg. SEATTLE, Arctic Bldg.

GRAVITY **FILTERS** PRESSURE

WATER SOFTENING PLANTS AND HYPOCHLORITE APPARATUS

ALL VARIETIES OF CHEMICAL FEEDING DEVICES

Write for Bulletin 17-3

THE NEW YORK CONTINENTAL JEWELL FILTRATION CO.

NUTLEY, N. J.

MICHIGAN PRODUCTS

Fire Hydrants
Gate Valves
Sluice Gates
Check Valves
Foot Valves
Shear Valves
Tide Valves
Sleeve Valves
Tapping Machines
Indicator Posts
Valve Boxes

FLOWER-STEPHENS MANUFACTURING COMPANY

103 Parkinson Street, Detroit, Mich.

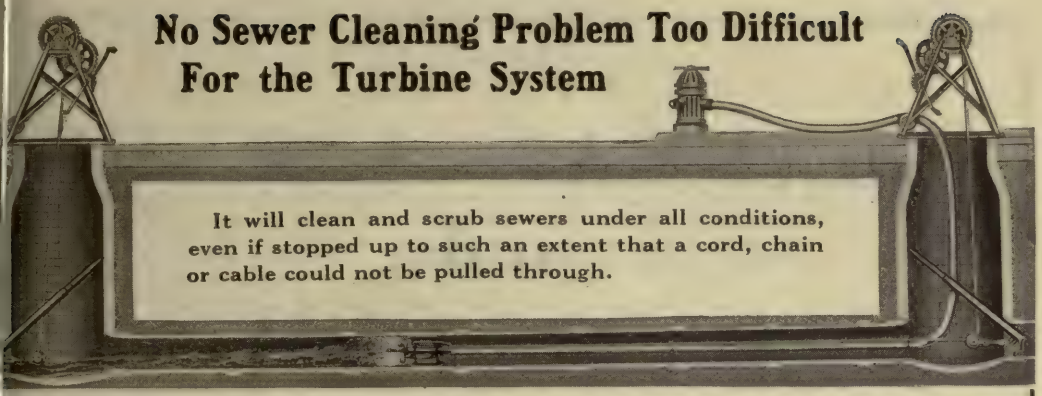
ATLANTIC PUMPING ENGINE

always four on any jo where wat has to b gotten rid quickly steadily, ec nomically.

Telegraph write for n prices and fu description.

HAROLD L. BOND COMPANY, 383 W. ATLANTIC AVE BOSTON, MASS.

No Sewer Cleaning Problem Too Difficult For the Turbine System



In partially clogged sewers the **Turbine** is drawn through by means of cable and windlasses. If completely clogged, the **Turbine Forcing Jack** is used in forcing an opening through the stoppage. Roots, grease, tar and other resisting materials have been easily moved.

Write for "Sewer Cleaning Equipment"

Turbine Sewer-Machine Company
Incorporated
197 11th Street, Milwaukee, Wis.

"Let those now love who've never loved before,
And those who always loved now love the more."

LAMBERT WATER METERS

Long Life.

Lasting Accuracy.

All parts interchangeable.

Maintenance cost nominal.

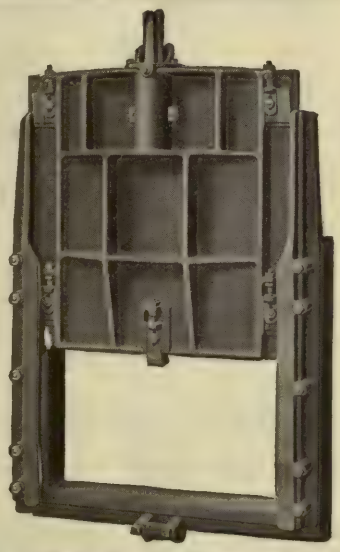
Their merits have made meter systems popular. A good article is always worth the price. All improvements which the tests of time and long service show to be requisite in a **Perfect Water Meter** are embodied in the **Lambert.**

ONE MODEL ONLY

Made in all sizes, ⅝" to 6", of best bronze Composition throughout, fitted with Unbreakable reinforced disc-pistons.

Illustrated Price List on Application. Address Dept. C.

THOMSON METER CO.
100-110 BRIDGE ST., BROOKLYN, N.Y.



Sluice, Head and Penstock Gates
Flap and Shear Valves

The kind that don't wear out

COLDWELL, WILCOX COMPANY
Water Street **Newburgh, N. Y.**

CHAPMAN VALVES
and
ACCESSORIES

Everything for Water Works and Sewage Disposal but the Pipe.

Corporation and Curb Cocks.

Goosenecks—made up with Anderson couplings which eliminate wiped joints.

Gate Valves
Sluice Gates
Hydrants

Catalogue containing valuable information free on request.

Write Today

THE CHAPMAN VALVE MFG. CO.
Indian Orchard, Mass.

Chemicals for Water Purification

We manufacture highest grade of

Sulphate of Alumina

also

Chloride of Lime

Liquid Chlorine

PENNSYLVANIA SALT MFG. CO.

WIDENER BLDG. :: :: PHILADELPHIA, PA.

R.D. Wood & Co.

PHILADELPHIA, U. S. A.

ENGINEERS
IRON FOUNDERS
MACHINISTS

Pipe, Hydrants, Valves, Gas Producers, Pumps, Gas Work Materials

Filtration Plants

for

Municipal Needs

Y. M. C. A's, Colleges and all Institutions

Write for Booklet

NORWOOD ENGINEERING CO.
Florence Mass.

When You Save Coal You Save Money!

Did you ever stop to consider that clogged water mains necessitate the use of an extraordinary amount of coal, thereby creating a large added expense?

A clogged main requires a stronger pumping pressure and that in turn requires more coal.

There is no earthly reason why a city should allow such a condition to exist, especially when it can be done away with very easily.

Most cities have found that

The National Method

of cleaning mains is the simplest, quickest and cheapest. The mains are "cleaned and scoured" and restored to their normal capacity. Scores of cities have had and are having their mains cleaned in order that they may get a stronger pressure and effect a saving running into thousands of dollars annually.

Write for free book "The Cleaning of a Water Main." It shows you how to cut down your coal bill.

National Water Main Cleaning Co.

Hudson Terminal Building

NEW YORK CITY

GREAT WESTERN ELECTRO CHEM CO.
BUSH, BEACH & GENT
SOLE AGENTS
CARBON TETRACHLORIDE
POTASSIUM CHLORATE
BLEACHING POWDER
LIQUID CHLORINE
CAUSTIC SODA
SAN FRANCISCO, CAL.

A Contract is a Contract

80 Maiden Lane
NEW YORK

Holbrook Building
SAN FRANCISCO

LIQUID CHLORINE

CHLORIDE OF LIME
(Bleaching Powder)

—SODA ASH—

Meter, Roadway, Service and Valve Boxes

Municipal and Special Castings

ANYTHING for WATERWORKS

Write for Catalogue and Prices

MODERN IRON WORKS
510 Ohio Street Quincy, Illinois

The Best Material for CALKING Joints in Cast Iron Pipes is

Ulco Lead Wool

Write for particulars to

UNITED LEAD COMPANY
111 BROADWAY, N.Y. CITY

PURE

Liquid EBD Chlorine

INSURES PURE DRINKING WATER

And the cost is so trifling. Just think—for 2c a year per capita you insure every man, woman and child in your town against the ravages of typhoid and other water-borne disease.

Write for free book—"THE WISE CITIES"—It tells why.

Electro Bleaching Gas Company
16 E. 41st St. New York City

KEEP YOUR METER OUT OF THE REPAIR SHO

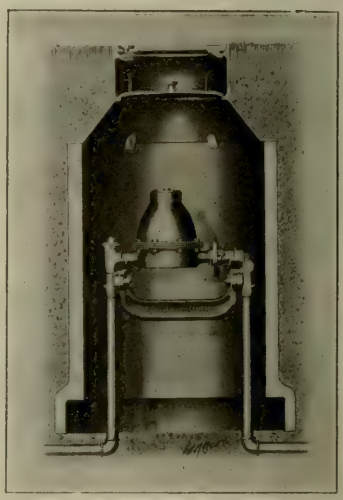
FORD METER BOXES wil help to keep your meter out of the repair shop by protecting and safeguarding th delicate mechanism from th destroying hands of Jack Fros and human meddlers.

Ford-Boxed meters can' freeze because they are protected by earth's heat and ar air-tight cover.

Ford Meter Box Covers com off only for the meter readers thereby putting an end to th "not-at-home" delayed readings.

Ford Meter Boxes mean ABSOLUTE PROTECTION—nothing more—nothing less.

Let us send you circular matter telling you more about the Ford Meter Box and how it can save your water department some real money.



THE FORD METER BOX CO.

WABASH, INDIANA

AMERICAN AND NIAGARA

WATER METERS

WRITE FOR LITERATURE BELOW

WRITE FOR TRIAL METER

WATER METER RATES AND REGULATIONS
ADVANTAGES OF USING WATER METERS
MODEL WATER METER SPECIFICATIONS
FACTS AND FIGURES ABOUT OUR METERS IN SERVICE
AMERICAN AND NIAGARA WATER METERS
WATER METER ACCESSORIES
SETTING AND TESTING WATER METERS
PRICE LIST WATER METERS AND ACCESSORIES

ADJUSTABLE MANHOLE TOP

An Adjustable Manhole Top with a cover which stays in place and does not Rattle.

Especially adapted to meet the strenuous requirements of varying grade changes and surface wear—incident to heavy and mixed traffic.

Notwithstanding general shortage of materials and difficulties of transportation. We can make PROMPT SHIPMENTS.

Write us for detailed information.

S. E. T. VALVE & HYDRANT COMPANY
Hudson Terminal Bldg., New York City

PIVOT LOCK COVER

For Manholes Meter Boxes

Street Sweeping Receptacles

SAFE, ECONOMICAL and SANITARY

Write for details

THE EAST IRON AND MACHINE CO., Lima, O.

ORIGINAL

OF COURSE WE HAVE IMITATORS
YOU KNOW WHY—

the Clark Meter Box has *made good* in 25 years of actual service. Thousands of water departments use it. No other "*Just As Good*" Can't Be.

Prices are the lowest. Quick delivery. Other Clark Goods are in same class.

Trade Mark

H. W. CLARK CO.
130 So. 17th St., Mattoon, Ill.
Everything for the Water Works

New York — Salt Lake City
San Francisco — Chicago

RAILS Locomotives, Cars, Machinery, Piling, Tanks

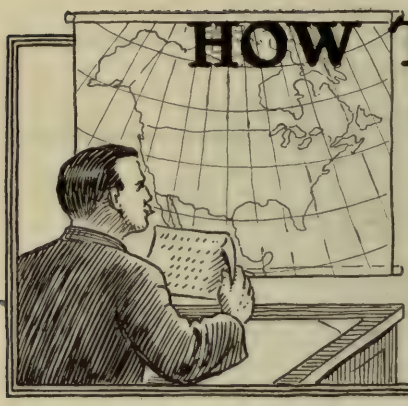
We've got too much

to list here, so we've issued

Bulletin 230

68 pages. *Get it now!*

ZELNICKER IN ST. LOUIS



HOW THEY DO IT IN OTHER PLACES

Valuable Illustrated Material, Statistics, Etc., Regarding Methods, Materials and Appliances for Public Improvement Work, Sent Free of Charge

Manufacturers, engineers and others doing business with municipalities are invited to submit catalogs or circulars suitable for mention in these columns. THE AMERICAN CITY *should always be mentioned when writing for this material. Officials who check over these items each month and write for such printed matter as interests them will find this a convenient way of keeping their information files up to date.*

Water Waste and How to Stop It

A booklet is being distributed on request by the Pitometer Company, 55 Duane Street, New York, relative to the prevention of water waste, which should be in the hands of every city official or private citizen interested in the tremendous losses which most cities are undergoing on account of waste in water distribution.

Cement in Home Building.

In a booklet entitled "Information for Home Builders," the Atlas Portland Cement Company, 30 Broad Street, New York City, presents in a striking way the possibilities of stucco for the beautification of homes. A number of interesting loose leaves which are furnished with this booklet show charming and homey stucco residences, and serve still further to emphasize the power for ornamentation that lies in the judicious use of this form of cement. Attention is also directed to the practical value of stucco as a fire-and-weather-proofing agency.

A Complete Line of Road Machinery.

Road-making machinery from A to Z is described in general catalog No. 18, issued by the Austin-Western Road Machinery Company, Chicago, Ill. From graders and rippers, thru stone crushers, road rollers, drags and planers, to road sprinklers and oilers, dump wagons and sweepers, equipment for every phase of road construction and maintenance is brought to the reader's attention. At the end of the catalog is a bibliography of the company's literature on special equipment.

Buy Seeds for Your War Garden Now.

With the spring drive for more war gardens, it is expected that the demand for seeds will keep the nurseries on the jump. An attractive catalog, "Burpee's Annual," has been issued by W. Atlee Burpee & Co., Philadelphia, Pa., listing in an entertaining and readable form a great variety of vegetable and flower seeds, bulbs and roots. The catalog is replete with illustrations and colored plates, and should make a handy guide for everyone who is planning to grow a war garden this year.

A New Medium for Water Filtration and Aeration.

In a booklet entitled "Filtros: The New Porous Mineral Medium," the General Filtration Company, Inc., Cutler Building, Rochester, N. Y., calls attention to a new product defined as "a white, rigid porous, artificial stone composed essentially of silica." This substance is manufactured in grades of varying porosity, and is applicable to either the filtration or the aeration of water. Its characteristic and adaptations are summarized in the booklet, and attention is called to other literature which treats separately and in detail these various uses.

Jail Work of Every Description

Municipal officials having to do with prison work will be interested in the catalog distributed free on application by the E. T. Barnum Iron Works, Detroit, Mich., describing jail entrance doors, jail cells, jail bedsteads, steel window guards, sanitary jail equipment and other prison specialties.

Surveying Instruments.

An attractive 124-page catalog has been issued b the Buff & Buff Manufacturing Company, 22 Lamartine Street, Jamaica Plains, Boston, Mass This booklet presents a great variety of survey ing instruments and accessories. Clear photo graphic illustrations, accompanied by descriptiv text, specifications and prices, give all the neces sary information regarding each instrument. Par ticular stress is laid upon the exacting care tha goes into the manufacture of all Buff product and interior views of the factory show the variou departments where the work is done.

Camp Water Supply Sterilized With Liqui Chlorine.

Uncle Sam places a lot of faith in the merit o liquid chlorine as a sterilizing agency. Witnes the flattering list of Government orders for thi type of equipment for the various camps and train ing stations as it appears in the two-page folde entitled "W & T Apparatus and Uncle Sam," re cently issued by Wallace & Tiernan Company Inc., 137 Centre Street, New York.

Heavy Dump Trucks for Contractors an Municipal Departments.

To contractors and municipal departments that d trucking on a large scale, and to whom, therefore a large-capacity truck means increased efficienc and economy, the two booklets issued by th Sterling Motor Truck Company, 830 Rogers Street Milwaukee, Wis., will be of unusual interest The pamphlets describe, respectively, the Sterlin 5-ton and 7-ton dump trucks for heavy duty Eight points of special appeal are brought to th reader's attention. The body of each pamphlet i given to detailed specifications, supplemented b photographic illustrations and construction draw ings. Motor trucks for lighter service are de scribed in separate pamphlets.

A Tank and Tower Offering.

Zelnicker, St. Louis, Mo., in Bulletin No. 234 offers a bargain in a 20,000-gallon steel tank mounted on a 75-foot tower. The tank is 13 fee in diameter, with a 36-inch balcony.

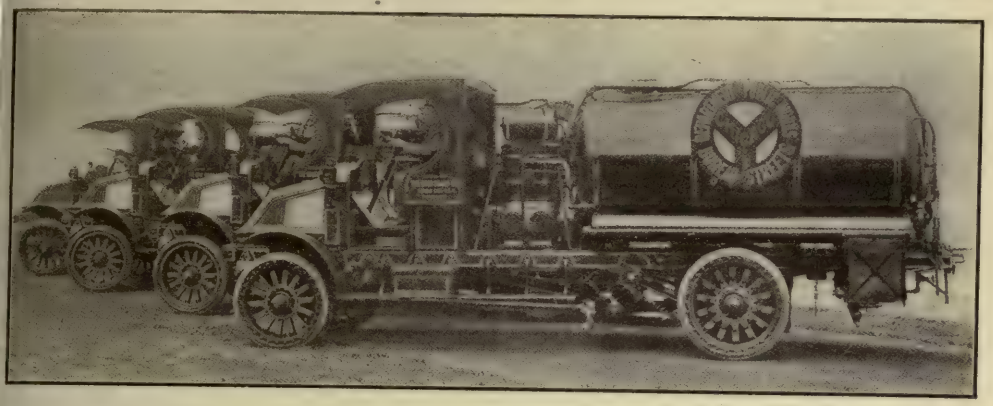
A Calendar Circular on Expansion Joints

A series of monthly calendars are being issued b The Philip Carey Company, 8 Wayne Avenue Lockland, Cincinnati, Ohio, covering the use o Elastite expansion joints in sidewalk and pavin work. Anyone interested in road or sidewalk con struction may, upon application, have these calen dars sent to him each month without charge.

Utilizing the Tractive Power of Trucks.

A number of exceptionally strong selling circular have been issued by the Watson Wagon Company 30 East Center Street, Canastota, N. Y. The present an unanswerable argument for trailers a a means of full utilization of the tractive powe which all heavy trucks possess in excess of thei carrying capacity. Perhaps better than in an other way the case is presented in one circular b means of little sketches, contrasting the ocea liner with the small tug drawing a steamer load an elephant carrying the load which a horse ca draw, a great giant carrying on his back the loa a man can pull on a hand-drawn trailer. Savin of time, labor, power and duplicated expenses ar other arguments advanced.

Continued on page 36



August 14, 1917.

The Good Roads Company,
14th & Chestnut Streets,
Kansas City, Mo.

Gentlemen:-

Answering your inquiry beg to inform you that the four combination oilers have been received and are in use on the streets in the City of Chicago.

I am more than pleased with the work they are doing and feel that they are positively the best machines of the kind on the market. We intend to keep strict account of the work the same do as compared with work previously done, and we will be glad to advise you at the end of the season as to the difference. I feel that the City of Chicago will save the price of these machines in one season.

Yours very truly,
G. F. Mitchell
Superintendent of Streets.

FSM-B.

THIS year the city purchased four combination road oilers and flushers from the Good Roads Company of Kansas City and, in addition to oiling all macadam streets in the city, we had the machines to put into the service of flushing when not engaged in oiling. We find these machines excellent in every respect, and the air compressor is a great improvement over the pump, which was always wearing out in our old street flushers.

C. A. RITCHIE — C. B. RAMSEY, Superintendent — H. T. RITCHIE

RITCHIE BROTHERS
PAVING CONTRACTORS
Camp Funston,
Junction, Kansas.

The Good Roads Co.,
Kansas City,
Missouri.
Gentlemen:-

Since we received the asphalt distributor, manufactured by your company we have finished approximately 40,000 square yards of asphalt macadam road in our work at the Army Cantonment at Camp Funston.

The distributor has proven satisfactory to the government inspectors in charge of the work and the performance of the machine has been all that could be desired.

We are using a "96 penetration" pure asphalt and have not had the slightest trouble with nozzles clogging as the steam cleaning process does its work thoroughly.

The asphalt arrives on the road at a higher temperature than when it is put in the tank of the kettle car which shows that the heating system is performing in a satisfactory manner.

We have spread 6400 gallons in a day and on passable roads in fair weather should do it regularly.

Very truly yours,
Amerman Ritchie Bros. by H. J. Ritchie

THE machines above shown and described are manufactured by us and have recently been adopted by some of the Government camps in controlling the dust situation in cantonments. One of our large machines is in operation at Camp Funston, Kansas, by Amerman and Ritchie, Government contractors. This was the only machine of many demonstrated at that camp capable of spreading asphalt in accordance with Government specifications. With the exception of some demonstration work by various other makes, this machine has spread all the asphalt for the Government in Camp Funston and is still on the job. Ritchie Bros. advise us that the machine worked perfectly spreading asphalt when the temperature registered six below zero with absolutely no trouble.

For catalog and complete information address

THE GOOD ROADS CO., 14th and Chestnut Sts., Kansas City, Mo.

Valuable illustrated material, catalogs, statistics, etc., as mentioned below, relative to methods, materials and appliances for public improvement work, will be sent free of charge if you mention THE AMERICAN CITY. See page 34.

Road Graders, Road Drags and Road Tools.

Any reader of THE AMERICAN CITY interested in machinery and road construction will find much of value in the catalog of J. D. Adams & Co., Indianapolis, Ind. The completeness of the line is indicated by the fact that fifteen different sizes of road graders are included.

A Labor-Saving Turbine Grader.

A pamphlet entitled "Koehring Turbine Grader" has been issued by the Koehring Machine Company, Milwaukee, Wis. It tells of a power grader which digs and loads from sixty to one hundred cubic yards of roadbed per hour. The grader is operated and propelled by its own power (gas engine), and is equipped with a digging wheel which makes a cut 5 feet 7 inches wide and from 1 inch to 2 feet deep. Full-page views taken from every angle show this machine in operation and help to convey some idea of the great labor saving effected by its use in road work. It is claimed that one of these machines performs the work of one hundred and twenty-five men, and thus saves the contractor, not only money, but a vast amount of inconvenience resulting from the present labor shortage.

Save and Serve.

is the title of a circular of the Atlas Portland Cement Company, 30 Broad Street, New York, relative to the possibility of reducing expense in connection with the use of cement. This circular and other literature of great value for cement users will be sent free on request.

Street, Highway and Traffic Signs.

are described in the catalog of the Lebanon Machine Works, Lebanon, N. H. The economy and desirability of these signs will appeal to municipal as well as county officials.

Up-to-Date Oil Pumps and Oil Storage.

The latest bound copy of the Bulletins of the S. F. Bowser & Co., Inc., of Fort Wayne, Ind., contains the most recent information about oil tanks, pumps and storage systems. These bulletins contain photographs, diagrams and descriptions of many varieties of pumping apparatus, tanks, accessories, etc., including oil filtering systems, and it will pay the official to send for these bulletins.

A Water-Works Equipment Catalog.

The Chapman Valve Manufacturing Company, Indian Orchard, Mass., has issued the second editio of its catalog No. 32, to supersede all previou issues. It is a cloth-bound book of 272 pages an lists a complete line of equipment for wate systems.

A Putting Green Sweeper

A brush attachment has been devised by the Penn sylvania Lawn Mower Works, Inc., John Brau & Sons, Philadelphia, Pa., for its lawn cleane and rake. By the substitution of three brushe for the steel-toothed rakes, the cleaner is con verted into an efficient machine for removin worm casts from putting greens without injury t the turf. These brushes, which are made of high grade fiber set in a hardwood head, are describe in a circular issued by the company.

A Two-in-One Road Machine.

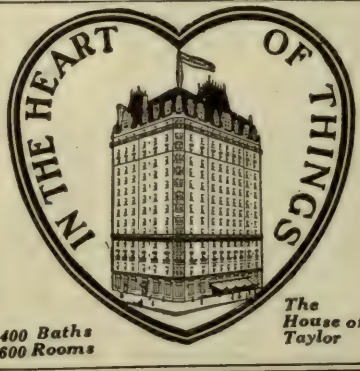
An illustrated circular is distributed free of charg by the Spaulding Manufacturing Company, De partment 240, Grinnell, Iowa, relative to a tracto or horse-drawn machine for road building or ditc making which combines the advantages of a load ing machine, a dump wagon, a road scraper and ditch digger, with very satisfactory and economi cal results.

An Instrument for Water-Works Efficiency

Efficiency, economy and conservation are made th basic arguments for the use of a Manograph b water-works officials, in a pamphlet which th Water Works Equipment Company, 50 Churc Street, New York City, has just issued on th subject of this instrument. The necessity for th elimination of water waste as a war measure i urged, and the Manograph is pointed to as a mean of accurately locating leaks, thefts, and exces consumption of water after it has left the pumpin station, as well as detecting slippage in the pum itself.

Drinking Fountains.

The catalog of the J. L. Mott Iron Works, Fift Avenue and 17th Street, New York, covers al sorts of drinking fountains, from the most modest style bubbler to the most elaborate known design of ornamental fountains for parks and public squares.



HOTEL MARTINIQUE Broadway, 32d St. NEW YORK, N.Y.

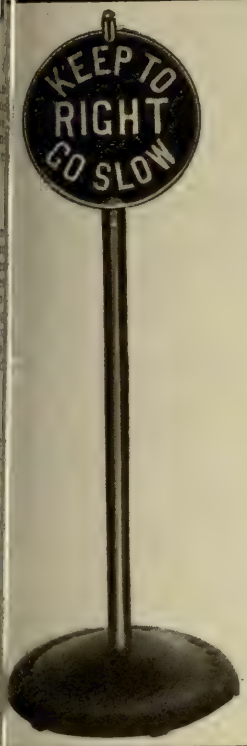
One Block from Pennsylvania Station.

Equally Convenient for Amusements, Shopping or Business

Pleasant Rooms, with Private Bath, $2.50 per day

257 Excellent Rooms, with Private Bath, facing street, southern exposure, $3.00 per day

Also Attractive Rooms from $1.50.
The Restaurant Prices Are Most Moderate



Traffic Sign Supremacy

The largest single order ever placed by any city for traffic signs has been placed with the Buffalo Municipal Equipment Company.

The contract was awarded by the Traffic Ordinance Committee of the City of Buffalo after inspection and tests of samples submitted by the leading traffic sign makers in the United States.

THE B.M.E. TRAFFIC SIGN

was adjudged the most artistic, to be made of the most serviceable materials for permanent street service, and it was the lowest in price.

You will find suggestions of practical value for municipal traffic regulation in our latest catalogue. Mailed on request.

Buffalo Municipal Equipment Co.

Mutual Life Building, Buffalo, N. Y.

Manufacturers of Traffic, Warning and Street Name Signs

SIGNS

All kinds of durable and ornamental signs.

Street Names, *Catalog B*
Road Direction
Park
Warning } *Catalog C*
Traffic, *Catalog D*

Catalogs illustrated in colors, send for any one or all of them.

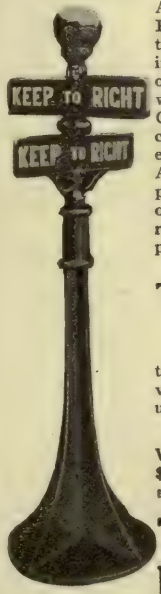
JOSEPH N. EARLY
Est. 1861
Patentee and Manufacturer
320 Broadway :: New York

King Poles and G. E. tops make the best lighted streets

Send for our beautifully illustrated booklet—free. Send name and address today.

KING FOUNDRY CO.
55 W. Jackson Blvd.
Chicago, Ill.

The Leb-Iron Traffic Sign



Wt. of Base, 150 lbs.
Total Wt., 225 lbs.

A Substantial, Efficient, Silent Policeman. The words "Keep-to-the-Right" are in 2½ and 1½ inch letters, rounded and stand out a half-inch from the boards, which are covered with Red or Green smalts as desired. The covering is carefully baked in electric ovens, insuring long life. A 7-inch Red or Green Globe is placed on the top, which is about on the level with the chauffeur's range of vision. It cannot be passed unnoticed.

The Base Weighs 150 Pounds

the complete sign, 225 lbs. Provision is made for wiring from underneath or overhead.

Price complete, including Wiring Lamps and Fixtures, $20; plain, with provision for attaching Lantern, $16.

The Lebanon Machine Co.
Lebanon, N. H.

Proposal and For Sale Notices, Help Wanted and Situation Wanted Advertisements, Etc.

SEWERAGE SYSTEM

STRATFORD, CONN.

Pursuant to a resolution adopted the 15th day of February, 1918, the Board of Sewer Commissioners of the Town of Stratford, Conn., will receive at its meeting to be held on the 25th day of March, 1918, at 8 P. M., sealed proposals for furnishing material and doing all other work required to the complete construction of a sewerage system in three sections as follows:

1st. Sewer laterals in Hollister Heights section.

2d. Trunk sewer.

3d. Sewage disposal works.

Plans may be seen and specifications and forms of proposals obtained at the office of the Board of Sewer Commissioners, Town of Stratford, Conn., or at the office of Clyde Potts, 30 Church Street, New York City.

Plans for any section may be taken away upon the payment of ten dollars ($10.00), the same to be refunded if the plans are returned within twenty (20) days in good condition.

Each bid must be accompanied by a certified check on a solvent bank for $2,000.

The Board of Sewer Commissioners reserve the right to reject any and all proposals and to waive any informality in the proposal received, and to accept any proposal which they deem to be most favorable to the interests of the town.

F. S. BEARDSLEY,
Chairman.

PAUL GOODELL,
Secretary.

COUNTY ROAD WORK

WELLSBURG, W. VA.

Sealed proposals will be received until 2 P. M., March 20, 1918, by the County Court of Brooke County for the construction of the following roads: River Road from Wellsburg south for a distance of 2.42 miles, consisting of .34 miles of brick on concrete base, and 2.08 miles of bituminous macadam. Beech Bottom Hill Road, .9 miles water-bound macadam, and Cross Creek Road, 3.36 miles bituminous macadam. It is desirable to have bidders contemplate grading alone, and grading and finishing complete, as it may be desirable to contract for grading only. The County Court reserves the right to reject any or all bids.

For plans, specifications and information apply to County Road Engineer, Wellsburg, W. Va.

H. C. BRASHEAR,
Clerk of County Court.

PUMPING EQUIPMENT

PRATT, KANSAS.

Sealed bids will be received by the City of Pratt, Kansas, up to 7:30 o'clock P. M. of the 21st day of March, 1918, for furnishing and installing the following equipment in the water-works pumping station of the city of Pratt, Kansas.

LIST OF EQUIPMENT

(1) One 350-hp. water-tube boiler for 175 pounds working pressure complete with all necessary piping, shaking grates and breeching.

(2) One radial brick or reinforced concrete chimney 125 feet high and 66 inches inside diameter at the top.

(3) Extending the boiler room by the addition of a room 20 feet by 48 feet inside.

Plans and specifications are on file at the office of the City Clerk, Pratt, Kansas. Copies of same may be had for $2.00.

The Commissioners reserve the right to reject any and all bids.

(Signed) W. O. HUMPHREY,
Mayor.

ROAD WORK

JOPLIN, MO.

Sealed proposals, addressed to the Commissioners of the Joplin Special Road District of Jasper County, Mo, and endorsed "Proposal for Improving State Road Project No. 17.2," will be received by the Commissioners until 1 o'clock P. M. on the 14th day of March, 1918, and at that time will be publicly opened and read at the office of the Joplin Special Road District, Cunningham Building, Joplin, Mo.

The proposed work includes 7½ miles of concrete pavement, 18 feet wide, together with the construction of culverts, the necessary grading and preparation of the present gravel surface to form a proper subbase and incidental work. Plans and specifications are on file, and may be inspected in the office of the undersigned, or at the office of the State Highway Department, Jefferson City, Mo.

A set of plans and specifications may be obtained from the undersigned upon deposit of twenty-five dollars ($25.00), which amount will be refunded if both plans and specifications are returned in good condition within ten days after date of awarding the contract.

Proposals shall be submitted upon blank forms provided for this purpose by the undersigned, and shall be accompanied by a certified check or proposal bond for eleven thousand and 00/100 dollars ($11,000.00).

The right is reserved by the Commissioners to reject any or all bids.

JOPLIN SPECIAL ROAD DISTRICT
OF JASPER COUNTY, MISSOURI,
By Sansom & Funk, Engineers,
Joplin, Mo.

STATE BRIDGE

CAMP LAKEVIEW, WABASH CO., MINN.

Sealed proposals will be received at the office of the Commissioner of Highways, 300 Shubert Building, St. Paul, Minnesota, until 10 o'clock A. M., March 15, 1918, for the furnishing of all materials and construction of State Bridge No. 2841 at Camp Lakeview, Wabasha County, Minnesota.

The bridge is a 50-foot rei
concrete through girder span
crete abutments.

Plans are on file at the office
Minnesota Highway Department

Bidders will note Section 38
eral Statutes of 1913, which
that no person engaged in manu
on State contracts shall work mo
eight hours in any calendar day

The right is reserved by the
sioner of Highways to reject an
bids and to waive any defects

must be accompanied by a
check payable to the Commissio
Highways for at least 5 per cent
amount of the proposal.

CHARLES M. BABCO
Commissioner of High
St. Paul,

Playground Appara
Business For Sal

A manufacturer desires to di
the playground apparatus end
business on account of the fa
the other lines manufactured
tate the space at present occu
the playground apparatus depa
An interesting proposition
made to anyone desiring to
the playground apparatus busi
to any manufacturer of anoth
who can add a department
manufacture of playground equi
Address Playground Apparatu
of THE AMERICAN CITY, Tribun
New York.

Recreation Su
desires change

16 years' experience in playg
construction, equipment
supervision

Address Box 101, Am. City

To the Secretar
a Chamber of
Commerce

If you have ability in
Chamber of Commerce
a good opening is now a
able which may int
you. Send a memoran
of your experience
salary desired. Box
The American City.

METROPOLITAN BRICK
IN DECATUR, IND.

This street in Decatur, Ind., was paved with Metropolitan Brick in 1894—twenty- our years ago—nearly a quarter century of service and still in splendid condition. This street is no exception—because where ever Metropolitan Brick is used you will find a quality pavement—a dependable pavement.

METROPOLITAN

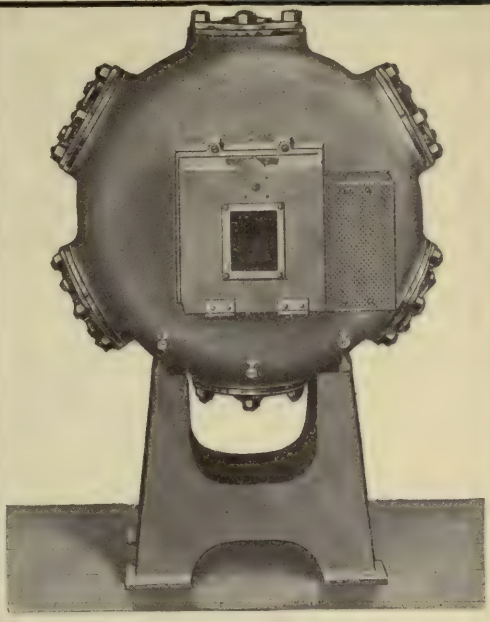
pavements are noted for their unusual long-life—ease of traction—and appearance.

Are you using Metropolitan Brick in your city—you know, its better to use it than to *wish* you had.

Get our free book "Shale Bed to Road Bed." It tells you WHY Metropolitan is THE brick.

Metropolitan Paving Brick Co.
Canton, Ohio

"The Best Paving Block Made"



R. U. V.

ULTRA VIOLET RAY
WATER STERILIZER

FOR

SWIMMING POOLS
DRINKING WATER, ETC.

The R. U. V. Method positively *eliminates* disease breeding bacteria—Filtration merely *reduces*.

Send for R. U. V. Catalog.

JAMES B. CLOW & SONS
Established 1876
534-546 So. Franklin Street, CHICAGO

Sales Offices

New York, Minneapolis, Detroit, Milwaukee, St. Louis, Denver, San Francisco, Los Angeles

Works

Chicago, Coshocton and Newcomerstown, Ohio

Put Public Buying on an Efficiency Basis

NOW, more than ever before, it is important that those having contracts to let, whether for new work or the furnishing of machinery or supplies, should consider the best methods of securing extensive competition and low bids.

Engineering News-Record

with a circulation of nearly 40,000 a week, reaches almost every worth-while contractor, manufacturer and dealer interested in public contracts.

Over 4,000 Official Proposals

have been published each year in Engineering News and Engineering Record, now consolidated as the Engineering News-Record. These small investments for advertising have invariably saved large sums on the contract prices. You can now cover the entire field and secure the greatest possible competition from reliable contractors by publishing your advertisements for bids in the

One Dominant Paper

This will put your public buying on an efficiency basis. It will make the tax payers' money go farther and will give you a reputation for a business administration. Local bidders always figure closer when they find that the letting of a contract is being advertised in Engineering News-Record — the

One Nationally Recognized Medium for Proposal Advertising

Ask for a free sample copy and see how other communities keep down their expenses

Engineering News-Record

10th Ave. at 36th St., New York

HAROLD S. BUTTENHEIM, Editor THEODORE R. KENDALL, Engineering Editor M. V. FULLER, Associate Editor

THE AMERICAN CITY

Published Monthly by The Civic Press, Tribune Building, New York. EDGAR J. BUTTENHEIM, President
HERBERT K. SAXE, Secretary-Treasurer JAMES H. VAN BUREN, Advertising Manager
Branch Offices: Chicago, 327 South LaSalle St., J. T. Dix, Western Representative
San Francisco, 320 Market St., W. A. Douglass, Pacific Coast Representative
Entered at the Post Office at New York, N. Y., as second-class matter

Vol. XVIII CONTENTS FOR MARCH, 1918 No. 3

ARTICLES APPEARING IN THE CITY EDITION ONLY

What Municipal Officials Can Do to Assist the Fuel Administration 193
In Time of War Prepare for Peace 195
Bituminous Foundations for Streets and Highways 196
The Treatment of Sewage by the Activated Sludge Process—Part III 199
An Overflowing War Chest 204
The War Chest Activities of Other Cities .. 207
Rio de Janeiro: The Fair Capital of Brazil .. 208
Some Legal Decisions Affecting Municipalities 213
One of the Weekly Mortality Reports Published by the U. S. Bureau of the Census. 214
Letters to the Editor 215
Financing War Housing
Cooperation Between Outgoing and Incoming Officials

ARTICLES APPEARING IN THE TOWN AND COUNTY EDITION ONLY

The Construction and Maintenance of Highways under War Conditions 193
Motorizing Maintenance 197
The Injury of Roads by Frost 200
Hard-Surfaced Roads Save Tractive Effort. 203
Road Surveys and Plans 205
Esthetics in Bridge Design 209
County Jails as Farm Labor Centers 215

ARTICLES APPEARING IN BOTH EDITIONS

The Status of the Daylight Saving Plan 217
Civic Work of Educational Institutions 219
Getting the Maximum Use of Our School Facilities
A Hygienic Score Card for High School Pupils 222
Forward Steps Reported by Municipal Officials and Heads of Departments 223
A City's Vast Watershed Park
Effective Home-Made Traffic Signs and Shelter
The Patrol System for Municipal Road Maintenance
Novel Features in Concrete Highway
Municipal Enterprise Supplies Water Free for Citizens
Telephones for Fire Alarm Signals
Toledo Reduces Pavement Patches
Open Air Schooling
Building a Park on Hard Blue Clay
New Scheme in Manhole Construction
Clergymen Aid Birth Registration
Health Posters by Public School Students
An Anti-Spitting Crusade
A Campaign to Save 100,000 Babies as a War Measure 238
On the Calendar of Conventions 240
Modern Electric Street Lighting 241
Sootless Saturdays 246
Fighting Fire in an Army Camp 247
City Manager Plan with Proportional Representation, for Kalamazoo 248
Items of Municipal Law 249
Enforceable Garbage Regulation
Revenue Measures and Interstate Commerce
Municipal Liability Concerning Streets
Municipal Fire Regulations
Liability for Slippery Streets
Valid Quarantine Regulation
Regulations Concerning Weapons
Motor Trucks Are Rendering Both Municipal and National Service 250
The Characteristics of a Lime Softening Filtration Plant 253
Phases of Garbage Disposal 257
News and Ideas for Civic and Commercial Organizations 259
The Replanning of Sherman
Charleston County Votes Bonds for Road Work
Manufacturers' Cooperative Auto Freight Service
Free Transportation Brings Trade
Saint Paul's War Activity Program
It Pays to Be Observing
Facilitating the Collection of Accounts
Gardeners Give Touching Patriotic Entertainment
Manchester's Clean-Up and Paint-Up Campaign
Federal Health Service for Fort Worth
Curbing the Rumor-Monger
How to Produce More Wool
War Declared on Sheep-Killing Dogs
Recently Issued Printed Matter
Municipal and Civic Publications 275
Methods, Materials and Appliances 279

Two editions of THE AMERICAN CITY are published each month, both containing the same number of pages. The distinction in contents is indicated above. The subscription price of either edition is $3.00. For $1.00 additional per annum, any subscriber may receive both editions; or any subscriber may have his name transferred from the mailing list of the City Edition to that of the Town and County Edition, or vice versa, without extra charge. Canadian subscribers pay 50c extra per year to cover postage; other foreign countries $1 per year extra.

Back numbers of THE AMERICAN CITY are kept in stock by the publishers.

Breaking Down The Transportation Question

The serious question blocking American business today is transportation.

Garford Motor Trucks are breaking through the freight congestion and assisting in bringing order and profit out of chaos for others.

Why not for you?

Your orders tied up in "No man's land" of shipping delays are losing money for you and for your customer.

Your problem is no longer one of producing, it is delivery.

Garford Motor Trucks, from one to six tons, are delivering products in the shortest possible time, at the lowest possible cost, with the least possible wastage.

They are dependable, efficient, and durable freight haulers.

Let our transportation experts help you at once.

You are doing business with a known quantity when you depend on Garford.

The Garford Motor Truck Company, Lima, Ohio

Manufacturers of Motor Trucks of 1, 1½, 2, 3½, 5 and 6 ton capacity. 4½, 7 and 10 ton Tractors
The Garford Road Builder

Distributors and Service Stations

New York, Boston, Philadelphia, Baltimore, Pittsburg, Chicago, Minneapolis, Salt Lake City, Seattle, St. Louis, Kansas City, El Paso, Canton, Portland, San Francisco, Columbus, Cincinnati, Los Angeles, Indianapolis, Harrisburg, Newark, Brooklyn, Toledo, Cleveland, Akron, Richmond, Chattanooga, Denver, Houston

VOLUME XVIII
NUMBER 3

The American City

NEW YORK
MARCH,
1918

How Municipal Officials May Assist the Fuel Administration

A Statement Specially Prepared for THE AMERICAN CITY by the Office of the United States Fuel Administration

CONSTANT and close coöperation between municipal officials and the Federal Fuel Administration is absolutely essential to the effective conservation and distribution of coal thruout the United States.

At the time of the appointment of Dr. Harry A. Garfield as Fuel Administrator, the demand for coal exceeded the supply by millions of tons, in spite of an increase in production of millions of tons over the output of 1916. There was a shortage of labor in many of the mines, due to the attractive wages offered by war industries, and more serious difficulties seemed imminent by reason of the demands of employes in the bituminous mines for increases in wages. Thousands of open-top cars, urgently needed in the coal trade, were being used for the transportation of other commodities. Unprecedented freight and passenger traffic had caused a congestion that seriously retarded the movement of loaded and empty coal cars, thereby making increased production impossible.

The administrative officials of the Fuel Administration consist of the Fuel Administrator at Washington and his corps of assistants, and an administrator in each of the states, who is assisted by an advisory committee and local committees appointed by him.

It has been demonstrated to the satisfaction of the Fuel Administrator that extension of the authority of the State Administrators increased the efficiency and expeditious handling of the business of the Fuel Administration. These administrators, therefore, have been clothed with full authority to dispose of every question relating to the conservation and distribution of coal within their respective jurisdictions.

Too much emphasis cannot be given the statement that local conditions and complaints should be referred always to the State Administrator, when they cannot be provided for locally, and should never be presented to the Administrator at Washington except by way of an appeal from a decision of a State Administrator. Strict adherence to this practice will not only save the office at Washington an enormous amount of unnecessary work, but will result in much more speedy disposition of the question involved, because such matters invariably are referred by the Washington office to the State Administrator for action.

Coöperation by municipal officials in discouraging any departure from this practice will be of great assistance to the Fuel Administration.

Prices of coal at the mine were fixed by President Wilson under the authority of the Lever Act. No specific provision was made, however, for determining retail prices. Accordingly, the Fuel Administrator, in order to protect the public against extortion, issued an order October 1 in which it was provided that the profit of each retail dealer should be based upon his average profit for the year 1915, plus 30 per cent, provided that in no event should

THE GRAPHIC MANNER IN WHICH THE PHILADELPHIA COMMERCIAL MUSEUM ILLUSTRATES THE MINING OF COAL

that profit be in excess of that made by him in the month of July, 1917.

One of the most important duties of the local committees has been the fixing of local retail coal prices, subject to the approval of the State Administrator. The enforcement and maintenance of those prices depends largely, if not exclusively, upon the extent to which consumers and municipal officials coöperate with the State Fuel Administrator, by reporting to him those dealers who charge prices in excess of those fixed thru the local committees. That coöperation is difficult to obtain from the individual consumer, because he is willing to pay virtually any price to get the fuel with which to keep his family from suffering, and fears to report an offending dealer lest he be refused further supplies. The onus of stabilizing prices, therefore, falls upon the local committees by which they were fixed, and municipal officials, whose means for detecting such offenders are ample, can assist in enforcing such prices.

Shortages of men and wagons with which to deliver coal have been among the most difficult problems local coal dealers have tried to solve.

The action taken by the municipal authorities of Washington during the intense cold and stormy weather in the early part of January of this year, furnishes a forcible illustration of the assistance such officials can render in meeting similar emergencies.

There was a supply of coal at the railroad dumps of Washington, but poor and rich alike were unable to get it because of a lack of men and vehicles with which to make deliveries. The street cleaning force of the city, which was in enforced idleness, was immediately placed at the disposal of the local fuel administrator, and was the means of affording relief to those who otherwise would have been exposed to certain suffering and probable disaster.

It is estimated that approximately 30 per cent of the electricity generated by electric railroads is expended in the heating of the cars.

While the elimination of all heat from such conveyances would undoubtedly meet with general and vehement protest, the average length of time spent in urban cars on a single ride does not exceed twenty minutes, and a material reduction in the temperature now required to be maintained in such cars would entail no hardship on the passengers, and would materially reduce the

nount of coal consumed by the railroad ›mpanies.

The power to regulate such matters rests ith the municipal or the state authorities, nd the subject is earnestly recommended to ie favorable action of all such officials.

The forcible seizure and unauthorized iversion of coal by state or municipal auiorities has been vigorously discouraged y the Fuel Administration, not only beiuse such acts are illegal and tend to inte other communities to similar action, but ecause effective distribution depends upon ie ability of the Fuel Administration to arry out its plans without interference. laving always before it minute details of ie needs of every community, the officials f the Administration believe they are in better position to determine the relative rgency of such needs than those whose information is restricted to local conditions.

Considerations of supply as well as those of demand must, and of necessity do, enter into the deliberations of the Fuel Administration, and interference with distribution nullifies arrangements that have been perfected after the most careful study and disarranges plans for numerous communities.

The Fuel Administration, therefore, earnestly bespeaks the coöperation of municipal and state authorities in its efforts to distribute coal as expeditiously as possible to the communities to which it is consigned. It assures all such officials that the needs of their several communities will be met in the order of their urgency, so far as is possible, and that they can best serve the interests of their fellow-citizens, and of the country at large, by assisting in carrying out the plans of the Fuel Administration.

In Time of War Prepare for Peace

AT the conference on community development for the war, held in Philadelphia, February 26, by the ›merican City Planning Institute, special mphasis was given to the importance of lanning now for the reconstruction period fter the war. The subject was introduced y Andrew Wright Crawford, Secretary of he Art Jury and of the City Parks Assoiation of Philadelphia, who pointed out the act that to make proper provision for the lack that will come immediately after the var ceases it is essential that plans for imrovements and the acquisition of lands iecessary for public works be begun in adance. Such processes often require more han a year, and, as Mr. Crawford showed, he preparation, approval and adoption of ›lans involve practically no workmen—they ake no men from war industries; neither loes the acquisition of land by legal proedure.

The importance of federal and local acion in this matter was further emphasized ›y Thomas Adams, Town Planning Adviser ›f the Canadian Commission of Conservaion, and the following resolution, introluced by Harold S. Buttenheim, Editor of THE AMERICAN CITY, was unanimously adopted:

"Whereas, The signing of a treaty of peace will inevitably be followed by a dislocation of industry because of the discharge of millions of workers in war trades and the demobilization of soldiers; and

"Whereas, It is in the power of the national and local governments to minimize the resulting unemployment and to promote the public welfare by starting the execution of new public works immediately after the war; be it

"Resolved, That this conference recommends to the Board of Governors of the American City Planning Institute that the Institute advocate thru the proper channels in Washington the immediate establishment of a Federal Commission of Reconstruction to make plans for meeting these post-war problems, and also request the President of the United States to urge the various state, county and municipal authorities to begin forthwith the preparation of well-considered plans for local public works, so that they may be undertaken promptly and without waste or extravagance, in so far as they may be needed to provide productive temporary employment for labor after the war."

It is suggested that among the public works for which such plans might be made are the building and repairing of streets and roads, the erection of schools, county institutions and other public buildings, the reclamation and afforestation of land, the reconstruction of slum areas, the development of parks and playgrounds, the provision of more adequate water supply, sewage disposal, fire protection, street lighting and other improvements which will provide employment for labor and promote the public welfare.

Bituminous Foundations for Streets and Highways

By L. Kirschbraun, Ch. E.
Director, Chicago Paving Laboratory

BITUMINOUS foundations are among the earliest types of base used for bituminous wearing surface, antedating other forms of foundation which are now more generally employed.

This statement is made without reference to the comparative merits of various kinds of construction, but rather with the idea of emphasizing to the engineer having to do with paving the fact that there is nothing novel or untried in this form of base, and that there are many asphalt pavements in existence laid on bituminous base, which, after 25 to 35 years of service, afford opportunity from a practical standpoint of basing conclusions regarding the serviceability of this type of construction.

Considerable information of an historical character with reference to bituminous base construction may be gleaned from patents issued in the paving field between 1870 and 1885. While only a few of the original surfaces of bituminous pavements in Washington, D. C., remain in existence, nevertheless several hundred thousand square yards of the old bituminous base construction have been resurfaced and used as a foundation for a new asphalt top. One of the oldest and best known sheet asphalt pavements on the continent, Vermont Avenue, in Washington, is a resurfacing job on old bituminous base. Aside from pavements laid in Washington, surfaces on bituminous base of some type were laid in Philadelphia, Buffalo, Pittsburgh, Chicago, Omaha, Denver, and probably elsewhere. In much of this old construction the wearing surface was shortly replaced or covered with a more durable top, the old bituminous pavement acting as foundation for the new surface.

Types of Bituminous Foundations

These bituminous foundations were generally of two types: (1) Courses of broken stone, covered with layers of tarred stone, the latter comprising sometimes several courses of successively smaller aggregates which were poured or mechanically mixed; (2) mechanically mixed aggregates deposited in courses or as a unitary structure upon the subgrade. Both types of foundation were covered with a bituminous wearing surface of smaller aggregate.

Within the last decade there has been a revival of this type of construction on the Pacific Coast and in the Northwest. This applies to those sections favored with a

LAYING MECHANICALLY MIXED BITUMINOUS BASE IN ANACONDA, MONT.

mild climate as well as those portions east of the Sierras, where frost and severe winters prevail. The construction of the base varies, but the better type consists of a mechanical mixture of well-graded aggregates coated with bitumen, of which the specifications of the city of Los Angeles afford a detailed example. Many hundred thousands of square yards of such construction have been laid in the last seven years, on heavily traveled city streets as well as on country highways.

It would therefore appear, both from old and from more modern construction, that there is nothing of an experimental nature in the use of bituminous base; that a service record is afforded covering a sufficiently wide range of traffic and climatic conditions to give engineers a satisfactory basis for the practical determination of the value and the limitations of this type of foundation.

Advantages of Bituminous Foundations

From the viewpoint of increased durability and economy of construction, the advantages of bituminous base, particularly of the mechanically mixed type, as foundation for wearing surfaces may be briefly set forth as follows:

1. Cracking of surfaces due to cracks in base will be substantially reduced. This applies more particularly to construction on concrete base.

2. As a result of the actual positive bond between wearing surface and foundation there will result greater stability of the surface and better resistance to displacement.

3. Deterioration resulting from the effect of traffic shocks will be considerably diminished on account of the shock-absorbing nature of the foundation, by the transference of shock to the base and by the absorption of shocks in the base. A rigid anvil-like structure under an asphalt wearing surface causes shock or thrust to be concentrated in the thin wearing surface, both as a result of direct impact from above and as a result of the reaction on the rigid base from below.

4. The waterproof character of a bituminous base affords protection from the action of moisture from below in rotting or disintegrating the under-side of the wearing surface.

5. Substantial economies result from the elimination of the binder course: reduction of labor organization employed by the contractor, reduction of equipment and idle time of paving plant; and in most cases the cost of bituminous base itself will be less than the cost of a concrete base. There should result, in addition, convenience to the public in minimizing interference with traffic, since base and wearing surface may be laid practically at the same time.

The Disadvantages of Bituminous Foundations

The disadvantages of this type of construction are:

1. Limitation of use to suitable subsoil conditions and the necessity for careful drainage.

2. Need for careful treatment of sub-grade, with special attention to trenches, to avoid uneven settlement, due to tendency of pavement to seek solid contact with the subgrade.

Need of a Pavement to Meet Changing Conditions

The foregoing considerations, together with the service record of this type of construction, lead to the conclusion that the bituminous base is a safe and durable form to employ as foundation for asphalt wearing surfaces. It affords opportunity for design of paving construction which provides unusual advantages in the way of economy and flexibility to traffic conditions both in cities and on country highways.

Engineers and public officials are frequently confronted with the problem of providing or selecting a type of pavement restricted as to a moderate initial cost, yet capable of giving economical service under light traffic conditions. The penetration or asphalt macadam pavement is one of several types of construction meeting these requirements. Traffic conditions, however, are changing very rapidly. The light traffic pavement of to-day may unexpectedly be called upon to carry a heavy traffic. The motor truck has already changed requirements of paving construction in the larger cities, where even the residential streets must be considered potentially carriers of heavy traffic. This is particularly true of sections of cities where building construction becomes a natural sequence of paving. A residential street in this way may for a time carry a very heavy traffic sufficient to cause material injury to a light construction.

Transportation conditions pertaining to the present war are even now developing a motor truck traffic of unexpected intensity upon country highways. Even the smaller cities must anticipate a future truck traffic not necessarily so great in volume as severe on account of weight. Naturally, pavements not adapted for such traffic will suffer.

It would therefore appear desirable to consider the practicability of design of pavement construction which will not only

BITUMINOUS SURFACE ON BITUMINOUS FOUNDATION, MAIN AVENUE, ANACONDA, MONT.

meet the modest local conditions previously mentioned, but which will provide for future contingencies of heavier traffic as described.

It is suggested that the bituminous surface on some form of bituminous base may afford a practical solution of these requirements,—namely, an initial low cost, applicability to light traffic conditions for a period of years, and, later, convertibility for heavy traffic without loss of original investment, or without material increase to property owners in cost per square yard per year.

The Design of a Convertible Pavement

The designing of a pavement of this kind would consist in providing a bituminous base without a wearing surface to meet the light traffic conditions. This would be laid at a grade permitting later addition of 2 to 3 inches of top. The base construction would be similar to present bituminous macadam, or, preferably, would consist of 5 to 6 inches of mechanically mixed bituminous concrete foundation with a squeegee finish. While such construction was serving for light traffic, it would receive the travel essential for knitting together, as in the case of the penetration type, but in either event it would have the opportunity of seeking full contact with the subsoil, developing the sufficiency of drainage conditions, and becoming consolidated and compacted to the best possible condition for receiving a standard wearing surface at a later date. Subsequent application of wearing surface, when conditions demanded, would involve no difficutlties. Unevenness developed by settlement, as well as minor defects thru ordinary use, would be remedied in applying the wearing surface. The surface of the bituminous foundation would be cleaned and treated with a surface heater or with a paint or softening coat so as to ensure a positive bond with the new surface to be applied directly thereon.

Construction of the character described obviates any uncertainty which might attend the success of the bituminous base and wearing surfaces when built at one operation, namely, the possibility of becoming uneven thru insufficient drainage or thru careless preparation of subgrade. The time elapsing between construction of base and surface might vary from a few weeks to several years. This construction would in effect duplicate the old bituminous base pavements previously referred to, in which the present base served for a time as the pavement proper before resurfacing.

Engineers are so thoroly familiar with the elements, i. e., base and wearing surface as just described, that the combination of bituminous surface constructed in this way upon a previously prepared bituminous base contains no factor of uncertainty or of untried practice.

Various modifications of this proposition afford an opportunity for the paving engineer to exercise his ingenuity in pavement or road design so as to meet any specific situation, with due regard to economy and to the character of material, subsoil and traffic conditions encountered.

The Treatment of Sewage by the Activated Sludge Process—Part III

Removing Sludge From Sedimentation Tanks

Several different methods of removing sludge from the sedimentation tanks have been carefully investigated in Milwaukee. Where hopper-bottom sedimentation tanks have been used, the air lift has been used principally. This method has two disadvantages—the excessive cost of pumping, and the production of a sludge of high moisture content. On the other hand, it has the advantage of easy control and increased aeration of the sludge.

The method of removing the sludge by means of the hydrostatic head, due to the difference between the elevation of the surface of the liquor in the tank and the top of the sludge draw-off pipe has the advantage of producing a much thicker sludge and a more uniform flow. This last is an important factor, in that it prevents to some extent the accumulation of sludge upon the side slopes of the tank, and thus less dissolved oxygen is absorbed in the sedimentation tank. By proper arrangement of the valves the sludge draw-off can be satisfactorily regulated, but care must be taken to avoid placing a valve in the draw-off pipe, as it tends to cause complete stoppage of the sludge flow. When possible, a sluice gate should be placed at the outlet of the draw-off pipe. In every hopper-type bottom tank which has come under the observation of the Milwaukee authorities there has been more or less sludge accumulation upon the sides of the tank. This sludge becomes septic and absorbs the dissolved oxygen, thus producing a lower-grade effluent from the sedimentation tank.

To overcome this tendency, flat-bottom tanks have been used and squeegees introduced to remove the sludge to a central blow-off pipe. Two types of apparatus have been used with success. The first is what is known as the Dorr Thickener, illustrated on this page. It consists of a slow-moving mechanism made up of a central, vertical shaft driven by a work gear and worm, the shaft having radial arms attached to its lower end. These arms carry plow blades tipped with rubber scrapers set at an angle which, thru the rotation of the mechanism, move the settled sludge to a discharge opening at the center of the tank. The mechanism is usually placed in a comparatively shallow, flat-bottomed tank into which the feed enters continuously at the center and from which the clear, decanted solution overflows and is collected in a peripheral trough. The sludge is taken off at the center of the tank bottom and is usually discharged by gravity.

From long-time tests it was found that the maximum allowable speed of the squee-

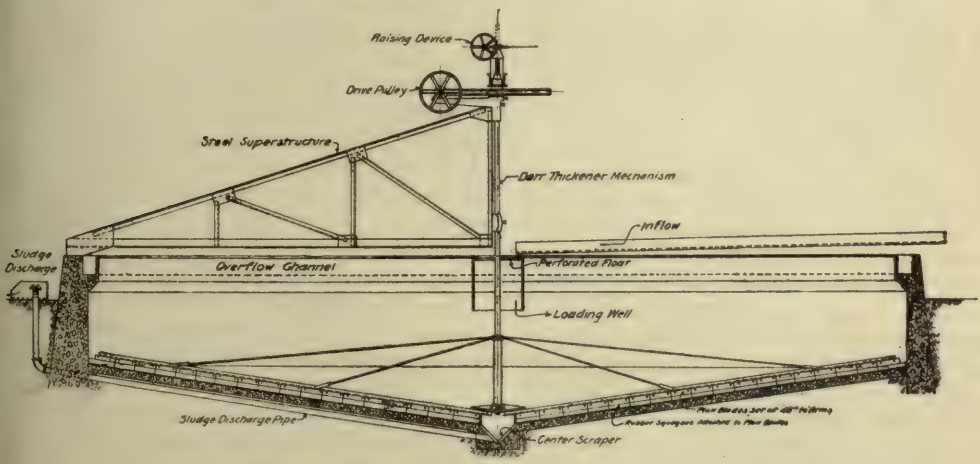
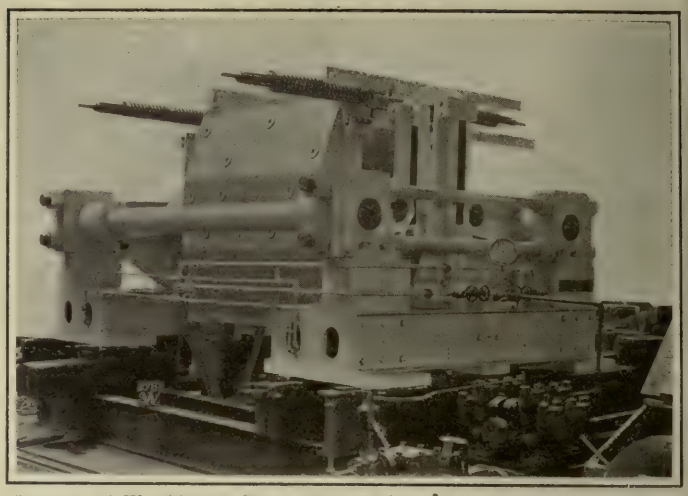


DIAGRAM OF THE DORR CONTINUOUS THICKENER

gee arms is about 12 feet per minute. Above this speed the sludge is disturbed too much and mixes with the supernatant liquor. The speed may be too slow and allow septic action before the sludge reaches the blow-off pipe. This should be avoided. At Milwaukee the sludge has been successfully precipitated by this process at the rate of 1,500 gallons of sewage per square foot of tank.



Courtesy of Worthington Pump and Machinery Corporation

THE BERRIGAN PRESS FOR DEWATERING SLUDGE

Another device satisfactorily demonstrated has been a squeegee moving over the bottom of a rectangular tank. The squeegee is attached to a slotted horizontal pipe, which in turn is attached to a vertical pipe, the latter being fastened to a car running on tracks built upon the top walls of the tank. This apparatus acts in the same way as a vacuum cleaner, the air lift being used to remove the sludge and the car being actuated by an independent motor with compressor or otherwise, as convenient. The advantage of this apparatus is that it removes the sludge in a denser condition than by any other method used at Milwaukee, for the sludge contained on the average only about 98 per cent moisture. Its operation is more expensive than that of the Dorr Thickener.

Either of the two last-named methods of sludge removal results in lower cost of sedimentation tanks, less depth being required than in the case of hopper-bottom tanks.

The denser the sludge removed from the sedimentation tanks, the less the area required for both aeration and sedimentation, because with dense sludge returned to the aerating tanks much less liquor has to pass thru these tanks to maintain the proper percentage of sludge. It is, therefore, probably true that the removal of sludge by mechanical means will greatly reduce the first cost of the plant and produce a much more satisfactory and uniform effluent. While pumping the sludge by air increases to some extent the oxidation of the sludge and maintains it in a well-flocculated condition, the increase of expense over that of using a centrifugal pump overcomes these advantages.

Dewatering Sludge

As stated before, the problem of the disposal of sludge is quite separate from that of the purification process and will be largely influenced by local conditions. The dewatering of sludge may be satisfactorily effected in several ways, depending upon its final disposition. Should the plant be small and the local temperature above 50° F., the wet sludge can be dewatered to 75 per cent moisture within a few days if the weather is favorable, upon beds of stone and sand, in the same way that sludge produced from Imhoff tanks is dewatered. In colder climates these drainage beds may be protected by glass buildings similar to hothouses. Sludge containing 75 per cent moisture or less can be kept under cover without creating an unpleasant odor. During the proper season it can be spread over tillable land in lieu of manure and in about the same quantities, and will be of great fertilizing value.

The sludge can be dewatered to 75 per cent water by means of presses of different types and the cake stored under cover and spread as described above. Carrying the dewatering still farther, the sludge may be pressed, dried and ground to produce a low-grade fertilizer, which is much sought after in this country and should have a ready

market in almost any locality.

The following remarks apply particularly to plants of considerable magnitude, producing sufficient sludge to warrant the expense of reducing it to a commercial fertilizer basis.

The sludge from hopper-bottom sedimentation tanks contains from 99 to 99.5 per cent of water. By allowing this to settle in a tank for from five to eight hours, the water content can be reduced to 96 per cent and the volume to one-eighth. This resultant sludge can be dewatered by any one of at least three types of press to from 75 to 80 per cent of moisture and to 1/57 of its original weight. It can further be dewatered by drying in any one of a number of standard types of dryers to 10 per cent moisture, and thus produces about 1/223 of its original weight. After drying, it must be run thru a grinder to reduce it to sizes applicable to an agricultural seeding machine.

Practically every engineer prominent in sewage disposal work in America who has visited the Milwaukee Testing Station has freely admitted the practicability of successfully treating sewage by the activated sludge process, but has expressed his doubts about the feasibility of disposing of the sludge economically. In fact, this phase of the problem has been a difficulty ever since the introduction of the process.

Special Studies of Dehydrating Apparatus

In order that the members of the Milwaukee Sewerage Commission should not deceive themselves in this important matter, they have spent many thousands of dollars in developing ways and means for the disposal of sludge and ascertaining the costs. These investigations have now continued for over a year and embrace the installation and operation of special settling tanks, presses, driers and grinders, by means of which hundreds of tons of the wet sludge have, under varied conditions, been reduced to dry, ground sludge, which has in turn been tried out upon growing crops in the vicinity of Milwaukee.

Careful inquiries have also been made of the manufacturers and dealers in fertilizers as to the market for such a fertilizer and the probable financial returns therefrom. It has been reasonably proved that Milwaukee is warranted in constructing and operating a plant of a size necessary to dispose of the entire output of sludge from an activated sludge plant treating the whole of Milwaukee sewage, and that this plant can be run at a profit.

The effectiveness of the various presses and other apparatus with which the Milwaukee plant has experimented is shown in the following statements: The Berrigan 6-by-9-foot press, manufactured by the Worthington Pump and Machinery Corporation, can dewater 96 per cent sludge to 76 per cent sludge at the rate of about 7 tons of pressed cake per 24-hour day. The 60-plate, 36-by-36-inch press manufactured by the Simplex Ejector Company of Chicago, Ill., can dewater 96 per cent sludge to 80 per cent sludge at the rate of from 7 to 8 tons of pressed cake per day. The Buckeye direct-heat dryer, measuring 60 inches by 40 feet, manufactured by the Buckeye Dryer Company, of London, Ohio, can dewater 76 per cent sludge to 10 per cent sludge at the rate of 27 tons of dry material per twenty-four hours, using one pound of combustible for 10 pounds of water evaporated. The indirect steam dryer of the Smith type can also successfully dewater the sludge, but at what maximum rate the Milwaukee Station cannot state, as it was never run at its maximum capacity.

The one important unsolved item in the cost of pressing is the cost of filter cloths or bags, and this cannot be solved except after a year or more continuous operation. The estimates have been based on the experience in Worcester, Mass., where Matthew Gault, Superintendent of Sewers, states in his annual report that it requires 2.2 yards of 40-inch No. 8 duck per ton of dry sludge produced.

The cost of pressing sludge is $4.82 per dry ton. This cost includes interest charges at 4½ per cent, depreciation of from 2 to 6 per cent, according to the character of the structure or apparatus, repairs and renewals, filter cloths at $1 per dry ton of sludge, power, labor and all other known expense.

The cost of drying is $3.93 per dry ton, which includes all charges as above named for pressing, except that 19 per cent depreciation is allowed for the dryers, $3.75 per short ton of coal, $0.00424 per kilowatt hour for power, and 8 pounds of water evaporated from one pound of combustible from

sludge cake containing 76 per cent moisture.

The typical analysis of dried sludge shows 5.1 per cent of nitrogen as NH_3, 5.3 per cent fat, 0.5 per cent soluble phosphoric acid and 0.25 per cent potash. In normal times the nitrogen is worth $2.50 per unit. At the present time it finds a ready market at $3.60. Basing the value of the sludge produced upon the lower price per unit, Milwaukee activated sludge would be worth $12.50 per dry ton, which represents a clear profit of $3.75 per ton. From present indications, about one ton of dry sludge will be produced per million gallons of sewage, with the profit named above.

In the very complete report of Messrs. Pearse and Richardson to the Engineering Committee of the Sanitary District of Chicago, and the committee representing the stockyards interests, dated April 16, 1917, it is estimated that the sludge pressing will cost $5.72 per dry ton, and drying $2.45 per dry ton, or a total of $8.17 per dry ton. In considering these costs, the fact must not be overlooked that the overhead charges are abnormally high, owing to the war price for all materials and labor required to install the plant. This price has been used thruout the estimates.

This last statement is particularly true of all the plans and estimates recently submitted to the Sewerage Commission of Milwaukee. The estimated cost of this plant for treating an average dry-weather flow of 85,000,000 gallons is $4,307,000, whereas eighteen months ago the same plant could have been built for $3,000,000.

Estimating that one ton of dry sludge can be obtained from 1,000,000 gallons of raw sewage treated, and an average daily dry-weather flow of 85,000,000 gallons, the net cost of disposing of Milwaukee sewage is estimated at $9.64 per million gallons, of which $4.89 is chargeable to overhead and $4.75 to operation, renewals and repairs. The 85,000,000 gallons of sewage per day is expected to be produced from a population of 589,000, and the net cost of operation, including overhead and maintenance, is 53 cents per capita.

Elimination of Odors

There is no offensive odor connected with the activated sludge process, but considerable odor may attend improper methods of sludge reduction. Partially dewatered sludge, if exposed to the sun for a few hours, gives off a highly objectionable odor of sulphuretted hydrogen. This odor lasts for a short time only, or until a dry covering is formed. Sludge placed under cover and not exposed to sun or wind gives off but little odor.

In drying the sludge thru a direct heat dryer, a very offensive odor is thrown off with the hot gases of combustion. To overcome this effectually, the gases must be run thru a dust box and thence thru a condenser, and the insoluble gases escaping from the latter should be discharged into furnace immediately under the fire grate. No flies, insects or worms inhabit the plant even during the early fall, when they are so prevalent in nearly all other types of disposal plants.

Conclusion

The foregoing statements and conclusions have been made as the result of observations and studies of the operation of the Milwaukee Testing Station covering a period of three years, during the last half of which experiments have been almost solely devoted to the activated sludge process.

Mr. Hatton states that he feels there are many phases of this process yet to be determined, which can only be done after operating a large plant, the important factors which influence the adoption and design of the plant having been proved.

In situations which require a high standard effluent, the most satisfactory process in use to-day is sedimentation followed by the use of percolating filters. The separate features of this process have been developed from year to year during the last decade, until it may be said to have reached the limit of its development. Even so, the sludge problem has not been satisfactorily solved where large plants are to be considered, inasmuch as the constant accumulation of partially dried and half-decomposed sludge is bound to create in the future a nuisance difficult to handle in a sanitary manner.

The only other process known to the Milwaukee authorities which can produce an effluent comparable with that from percolating filters is the activated sludge process, which, when developed to the extent possible and very probable within the next decade, will doubtless supersede the filters.

There are many advantages in this new process which must be considered; among them are the small area, lower first cost, and final disposition of the troublesome sludge.

While percolating filters treat a maximum rate of 3,000,000 gallons under favorable climatic conditions, the activated sludge process can treat 10,000,000 gallons per acre under the most unfavorable climatic conditions. The first cost of construction is more for the percolating filters than for the activated sludge process, and little difference is expected in the cost of operation.

Metcalf and Eddy, in Volume III of "American Sewerage Practice," give the following figures as to the cost of construction and operation of several important percolating filter plants: Gloversville, N. Y., cost $58,455 per million gallons, exclusive of roofing, the operating cost in 1914 being $5.92 per million gallons; Fitchburg, Mass., cost $59,650 per million gallons, with an operating cost of about $12 when treating 2,500,000 gallons.

The average cost of nine of the most modern plants in the United States is given as $47,000 per million gallons, these costs being exclusive of engineering charges. E. J. Fort, Brooklyn, N. Y., estimates the cost of overheads and operation for a plant treating 30,000,000 gallons will be $9.50 per million gallons, exclusive of the final disposition of the sludge. Mr. E. B. Ulrich, City Engineer, Reading, Pa., gives the operating cost of the Reading plant as $9.13 per million gallons in 1912.

The Milwaukee activated sludge plant, as designed, is estimated to cost $44,000 per million gallons, exclusive of engineering and pumping, and $4.75 per million gallons operating cost. This first cost embraces prices for labor and material which did not prevail when the percolating filters above alluded to were built. Mr. E. E. Sands, City Engineer, Houston, Texas, has recently completed an activated sludge plant, exclusive of sludge disposal, to treat 12,000,000 gallons at a cost of about $24,000 per million gallons, and expects to install the sludge disposal features for $40,000, the balance of his appropriation.

The high nitrogen content of the sludge produced by the activated sludge process warrants the expense necessary to reduce it to a fertilizer basis, and thus the sludge problem is effectually solved without nuisance. The absence of odors, flies and other insects is no small advantage. The absence of odors frequently enables the engineer to eliminate long, expensive outfall sewers. The small loss of head thru the process frequently obviates pumping, which is often required in the percolating filter process.

Thruout many of the discussions between engineers relating to this new process, the cost of power has been one of the stumbling blocks. In a small plant treating less than 5,000,000 gallons per day, the cost of producing the power might prove too expensive, but where larger plants are under consideration, power can usually be produced for less than one cent per horsepower hour. Such a cost will make the cost of operating the process upon an equality with that of operating the percolating filters. However, local conditions can best determine which of the two processes should be installed, but it is Mr. Hatton's contention that such determination should be made only after securing a thoro knowledge of the merits of the two processes and not from the point of view that one process has been successfully operated in many instances whereas the other is still more or less in the experimental stage. If the latter attitude were adhered to in the industrial field, little progress indeed would ensue.

ONE OF THE PUBLICITY FEATURES OF THE COLUMBUS WAR CHEST CAMPAIGN
In the background at the right is the War Chest, surmounted by the Columbus Liberty Bell

An Overflowing War Chest

By Don K. Martin

Publicity Manager, the Columbus [Ohio] Chamber of Commerce

By filling a War Chest with over $3,000,000 to meet war needs alone in less than five days Columbus, Ohio, has set an example for the whole country in practical patriotism. So strong was the appeal and so well was it put that almost 80,000 subscribers contributed their bit to the fund. The self-sacrifice called for in this campaign is worth infinitely more to the people of Columbus than the sum which was raised to help the soldiers "over there," and the result proves that at least one American community has found itself.

In the success with which Columbus was organized for the War Chest drive and in the extent and nature of the publicity campaign conducted, this project is unusual in the annals of community efforts. The success is due to the loyal and patient efforts of the men who were selected to supervise the various departments of the work. So complete had been the preliminary arrangements that in the five days closing Saturday evening, February 9, the War Chest was more than filled; a total of $3,071,088 had been subscribed by 73,126 people.

Two outstanding needs prompted the organization of the Columbus Community War Service, which directed the campaign: first, the necessity of developing some businesslike method by which Columbus, quickly and surely, and with a minimum of wasted effort, could meet the steadily increasing financial demands that are being made upon the city to support the movements designed to protect our armies and give aid to war-stricken peoples; and, second, the equally great, or greater, necessity of building in Columbus a single, practical organization that could bring to the whole city an intelligent understanding of what this war means to America, and develop a community state of mind that would enable Columbus to respond instantly to every national appeal for service. Stated more simply, it was an organized effort to enlist for the period of the war the dollars and the civilian man-power of Columbus, to give every citizen who cannot enter the army an opportunity to serve his country with his money and with his working ability.

The first task—the mobilization of money—is the simpler of the two. Its solution lay in the plan to fill a great Community War Chest. The Columbus plan was simply the application of the modern budget principle to the hitherto haphazard system of raising special funds for special war needs.

The organization itself was the development of plans devised after weeks of study

PHILLIPS LIBRARY

by the Social Service Bureau of the Columbus Chamber of Commerce, in which organization the nucleus for the successful carrying out of the project was found. Several weeks before the start of the campaign a score of public-spirited citizens visited Toronto, Canada, at their own expense, to familiarize themselves with the methods used in that progressive Canadian community in providing funds for war needs.

The Columbus Community War Service, comprised of a general committee of 100 appointed by the Mayor upon the recommendation of the Chamber of Commerce, selected an Executive Committee of eleven, several of whom were members of the Chamber's Social Service Bureau committee, which originally advocated the project. The 7,000 workers in the campaign were divided into the following twelve divisions under twelve divisional chairmen: individual subscribers, outlying individual subscribers, township subscribers, factory employe subscribers, utility employe subscribers, retail employe subscribers, public employe subscribers, general employe subscribers, homes division, meetings division, publicity division, and office or headquarters organization.

Preceding the start of the campaign on February 5, the homes division organization sent ward and precinct committees to every home in the city to distribute literature and explain the meaning and purpose of the War Chest. This organization followed up its work by soliciting in the homes. The workers were instructed to take no subscriptions from any organization other than a business firm or corporation or from dependent members of families.

In addition to the usual newspaper publicity explaining the project, full-page advertisements, billboard publicity, posters, pamphlets, and numerous kinds of literature were used. Large posters were carried by all the street cars, and one car was covered on the outside with billboards and driven through the city each day of the campaign. On the morning that the drive began, church bells and factory whistles kept up a continuous clamor for an hour.

Among the publicity features was a "Kaiser Board," erected in the State House yard, bearing 15-foot figures of the Kaiser, the Crown Prince, and Von Hindenburg. The heads of these Huns were on hinges, so that they flew back when struck with baseballs, which were provided by committees on duty at the "Kaiser Board" constantly. The day before the end of the campaign, "Kaiser Bill's" funeral was held at the "Kaiser Board," where a mock funeral oration was delivered, and the re-

THE "KAISER BOARD"—ANOTHER PUBLICITY ATTRACTION OF THE COLUMBUS WAR CHEST DRIVE

mains of his Hunship, in a large casket, were carried thru the streets in a dilapidated hearse drawn by four donkeys. Another feature was the placing of a hurdy-gurdy on one of the principal street corners bearing the placard, "Help grind up the Kaiser."

In the middle of East Broad Street, just north of the State House, was erected an immense War Chest surmounted by a Columbus Liberty Bell, a replicá of America's original Liberty Bell. After the luncheon meetings of the campaign workers, which were held each day, the workers marched to the Liberty Bell, where the total amount of the subscriptions received at that time was registered on a scale on each side of the War Chest.

For two weeks preceding the campaign a mythical symbol of "1 to 31—War Chest," appeared everywhere on banners, posters in street cars, on billboards and every page of all the local newspapers. At the start of the campaign the meaning of this symbol was made known as an estimated individual contribution to the War Chest fund of one day's pay out of every month. Based on annual incomes over and above $2,000, the following schedule of subscriptions was indicated:

Incomes,	$2,000 to $3,000,	one day's pay out of	20
Incomes,	3,000 to 5,000,	one day's pay out of	18
Incomes,	5,000 to 10,000,	one day's pay out of	15
Incomes,	10,000 to 15,000,	one day's pay out of	12
Incomes,	15,000 to 20,000,	one day's pay out of	11
Incomes,	20,000 to 25,000,	one day's pay out of	10
Incomes,	25,000 to 30,000,	one day's pay out of	9
Incomes,	30,000 to 35,000,	one day's pay out of	8

Even the traffic signs at the street corners bore reminders of the War Chest. Instead of the usual "Stop" and "Go" warning, they read, "Make Our War Chest GO" and "The Kaiser would like to STOP Our War Chest!" Elaborate decorations of flags and standards were displayed thruout the down-town section during the weeek.

On all the electric light standards at intervals of 60 feet along all the principal streets frames were hung bearing placards, which were changed daily. At the start they bore the message, "1 to 31—War Chest." In the following days they proclaimed, "Welcome Canadian Heroes," "The Hounds Are Loose To-day," "The Hounds Have Caught the Scent," "The Hounds Have the Kaiser on the Run," "Give or the Hounds Will Bite You," and "Is Your Conscience Clear?"

Perhaps the most interesting feature of the campaign was the visit of twenty-three wounded Canadian soldiers, who appeared at numerous public meetings and related their gruelling experiences at the front. Other speakers of national prominence appeared at the public meetings.

The subscription of one large industry which has been manufacturing supplies for the Government, including the subscriptions of its officers and employes, totaled $120,000. A number of other individual or company subscriptions reached the $50,000 mark. The spirit of the campaign, however, was best illustrated by instances such as a subscription of $116 made by nineteen blind men working in the broom factory of the State Commission for the Blind; a gift of $18 made by one young girl who earns but $4 a week; a delivery wagon driver who subscribed $20; a liberal subscription by a citizen born in Germany who has two sons and two brothers in the German army; a gift by the German and Austrian employes of a violin factory. So intense was the patriotic fervor of the community that the Mayor announced that any city employe who grumbled about contributing to the War Chest, unless he had a good reason for his objection, should be discharged.

"From every patriot according to his ability—for every worthy cause according to its needs," was the keynote of the campaign. "Can you afford *not* to give?" was the question hurled at the citizens from hundreds of placards.

Among the advantages of the Columbus War Chest may be enumerated the reduction to a minimum of the waste of time and effort heretofore occasioned by separate money-raising campaigns for each separate need as it developed; the inducing of all to give to the maximum of his ability; the conservation of the financial resources of the community; the elimination of relatively unimportant causes and the increase of the support of those more worthy; the raising of the patriotism of the community to a higher level, and the effecting of a new community spirit.

During the last six months of 1917, Columbus and Franklin County had raised $1,034,599 for war needs alone. This, of course, did not include the $12,000,000 subscribed to Liberty Bonds, nor the thousands invested in War Savings Certificates or

Thrift Stamps. Based on the estimated needs for the year from this one community for the Red Cross, the War Work of the Y. M. C. A., the Knights of Columbus War Work, the Jewish War Relief and other agencies, it was found that at least $3,000,000 would be required.

One of the most valuable benefits of the War Chest campaign in Columbus was the united spirit which it produced. The principal fact that was brought home was that this war is "your war" and "our war" and every American's war. Some must fight and some must pay, and *all* must sacrifice. The time will undoubtedly come when the man who made money and kept it while the nation fought for its life will not stand well with with his fellow-citizens.

Every dollar that was contributed to this War Chest will be used for war needs. Thirty-five firms and individuals contributed $1,000 each to carry on the campaign. This effort should set an example for other American communities which may have developed the same need for community coöperation that was found in the Columbus Chamber of Commerce. Secretary George W. Gillette, of the Chamber of Commerce, served as Secretary of the War Chest Executive Committee.

The War Chest Activities of Other Cities

The first instance of a community War Chest Fund reported to The American City was the Baltimore Fund of $1,500,000, started early in 1917 by the Alliance of Charitable and Social Agencies and the Red Cross of Baltimore, Md., to finance their work for a period of three years. Full details in regard to this plan were published in an article by Walter A. Parcelle, entitled "Baltimore Underwriting a Blanket War Insurance Policy," which appeared in The American City in June, 1917. The city of Syracuse, N. Y., adopted a similar plan, in which the Mayor took the initiative by issuing a proclamation prohibiting the soliciting of funds without permission of the general censoring committee. A plan was evolved whereby the citizens were called upon for monthly payments for the duration of the war, to make up a yearly war budget of $1,200,000.

One of the most carefully worked out plans for financing war charities is that adopted in Kenosha, Wis. This plan, the credit for which goes to C. S. Judd, is described in detail in a pamphlet entitled "The Kenosha Plan," issued by the Kenosha Chamber of Commerce, of which Richard F. Kaiser is secretary. It provides for a general fund administered under the authority of the County Council of Defense by a special committee of representative citizens; for uniform public support by voluntary contributions on the basis of giving "One Half-Hour Weekly to Soldiers and Sailors;" and, finally, for a systematic disbursement of the fund by a Committee on Investigation and Disbursement. Separate committees were appointed to superintend the actual money-raising in city and county.

The Rome, N. Y., War Chest Association is a duly incorporated body with unpaid officers, whose duties are prescribed in the constitution and by-laws. The plan includes installment payments based on salaries, and a permanent censoring committee. It is estimated that when the subscriptions are all in, Rome's citizens will have oversubscribed their War Chest Fund at the rate of $2 per capita. It is interesting to observe that while the number of subscribers to the fund amounted to 35 per cent of the total population, the employes of Rome's industries showed an efficiency percentage of 95.77 per cent.

In Elkhart, Ind., the organization assesses each citizen a sum proportionate to the amount of taxes he pays annually. Payments are monthly, and a different colored button is issued each month as a receipt. Further variations have been developed in Auburn, Augusta, Granville, Ilion, Ithaca, Little Falls, Utica and Watertown, N. Y.; Janesville, Madison, Milwaukee and Schleisingerville, Wis.; Elgin, Peoria, Rockford and Rock Island, Ill.; Adrian, Kalamazoo, Pontiac and Wakefield, Mich.; Elizabeth, Nutley, Trenton and Westfield, N. J.; Rochester and Washington, Ind.; Columbus and Oak Harbor, Ohio; Pittsfield and Salem, Mass.; Crete, Neb., and Toronto, Canada.

Under this heading is being published during 1918 in THE AMERICAN CITY *a series of articles on Central and South American municipalities, thru the courtesy of the Pan-American Union. The Pan-American Union is the international organization, with headquarters in Washington, D. C., maintained by the twenty-one American republics for the development of good understanding, friendly intercourse, commerce and peace among them. The fourth article of this series will deal with municipal conditions in Santiago, Chile.*

Rio De Janeiro, The Fair Capital of Brazil

TO anyone who has visited the beautiful metropolis which the Brazilian people have built on the shore of the blue, island-studded Bay of Guanabara, the thought of such prosaic things as civic organization, power houses, workshops, and factories seems to be incongruous. Rio de Janeiro, altho a splendid model of civic efficiency in many material respects, appeals to the visitor primarily as an object of rare beauty, rather than the subject of a disquisition on civic legislation, executive efficiency, and manufacturing development. But all these things have entered into the making of this lovely "city of gardens."

Early Development

The town, which was founded by Portuguese colonists, grew but slowly. By 1648 it boasted of only three streets, and made no pretensions to rival Bahia, then the capital. The marshy lands continued to be drained, and from time to time new streets were added and more settlers came in, so that by 1763 the little city achieved the honor of being proclaimed the capital of the Viceroyalty of Brazil.

Prior to this time the famous Carioca Aqueduct had been built to supply the city with pure water from the height of Corcovado. The cultivation of coffee and rice had been introduced.

In 1822 the country, by means of a peaceful revolution, at the head of which was Dom Pedro, declared its independence of the mother country and established the Empire of Brazil, with Dom Pedro I as its Emperor. He was succeeded in 1831 by his son, Dom Pedro II, who reigned until the final establishment of the Republic in 1889. By 1890 the city's population had grown to 522,000. Steam navigation between Rio and Europe was inaugurated in 1851. The city was first lighted by gas in 1854, and the first railway to enter the city proper, now the Central Railway of Brazil, was commenced in 1858. The trans-Atlantic cable was finished in 1874. A new waterworks system was installed in 1880.

By 1890 Rio had become a cosmopolitan city of considerable commercial importance. There were quite a number of fine buildings, a few good parks and other desirable features, but the city was scattered, a sort of straggling conglomeration of several disconnected sections built between the picturesque hills and mountains down to the bay. As a rule, the streets were narrow and traffic-congested, and most of the houses were of poor and flimsy construction. The old Rio of the Empire, owing to the prevalence of tropical diseases, chiefly due to lack of sanitation and the presence

of mosquitos and other germ-carrying insects, was one of the ports dreaded by the seafarers of the world. A regeneration was necessary, and that regeneration was inaugurated immediately after the peaceful revolution of 1889 had transformed the empire into a republic.

The Reconstruction of the City

Many plans for the improvement and partial reconstruction of the city had been advocated from time to time, but it was not until the administration of President Rodrigues Alves, inaugurated as president of the Republic of Brazil in 1892, that these plans took practical and definite shape. The new president was an energetic and enthusiastic advocate of civic improvement. He appointed Dr. Lauro Müller, a military engineer of marked ability, as minister of public works; Dr. Francisco Passos, an able civil engineer of remarkable executive talents, was appointed prefect, or mayor, of the city; Dr. Oswaldo Cruz, a great sanitary expert, was placed in charge of the sanitary features. These men were given *carte blanche* to effect the desired improvements, the plan for which may be briefly outlined as follows:

(1) The construction of a quay following in general the shore line for a distance of 2 1/6 miles.

(2) The construction of a broad avenue parallel with the quay and of the same length.

(3) The improvement and prolongation of what is known as the Mangue Canal, with an avenue on both sides, about 2 miles in length and 131 feet in width, the whole to be lighted with electricity.

(4) The elevation of the railroad bed and the construction of an avenue following the line of the old Francisco Eugenio Street to the Quinta da Boa Vista, the beautiful park in which was located the former residence of Dom Pedro II, now converted into a museum.

(5) The enlargement of the water-works by combining all the sources of supply.

(6) The complete overhauling and improvement of the sewerage system and the scientific sanitation of the city.

(7) The construction of an avenue, 1⅛ miles in length and 108 feet wide, thru the heart of the business section of the city, now known as the Avenida Rio Branco.

(8) Grading and cutting down some of the hills in the city.

(9) Widening and improving some of the streets crossing the new avenida.

In order to accomplish this tremendous undertaking two loans were contracted, one a foreign loan of $40,000,000; the other a domestic loan by the municipality of $20,000,000. With these funds on hand, the work was begun upon the promulgation of the decree of September 18, 1903.

Of these undertakings, all of which were successfully carried out, those which strike the visitor to Rio most forcibly are the splendid quay and port works, the great Avenida Rio Branco, and the magnificent bayside boulevard known as the Avenida Beira Mar.

The great stone quay, over 2 miles in length, is built in many places at a considerable distance out from the old shore line, several islands and small bays being included in the work. The harbor was dredged to a depth of 32.8 feet and a width of 820 feet, affording a broad ship channel along the face of the quay. Back from the quay the land was filled in to a depth of from 12 to 40 feet, and an avenue 328 feet in width was constructed following the new shore line. This avenue is apportioned in three strips—a paved thorofare 40 meters wide, lined with rows of trees, a strip 35 meters wide for business houses and offices, and the remaining 25 meters given over to railroad tracks. The whole quay is provided with modern loading and unloading machinery and devices, and two electric plants furnish the required light and power.

The Avenida Rio Branco is a remarkable example of Brazilian energy and civic efficiency. To permit of its construction 590 houses had to be demolished, the ground leveled and graded, the street paved, ornamental trees planted, etc., and a force of 3,000 men were kept busy working in day and night shifts until at the end of six months the avenue was finished. It extends thru the business section practically parallel with the eastern shore frontage of the central district of the city; three rows of trees—one row along each side and one in the middle—add greatly to its beauty, and fine business houses, hotels, cafés, and public buildings line it for the entire length of over a mile. In the southern half of the avenida the café proprietors are permitted to place their tables in rows on the broad sidewalk, leaving just about enough space in the center for the constant stream of pedestrians to pass, and in the late afternoons and in the evenings the street presents a remarkable scene of animation and gayety. At night the lavish use of electricity gives the avenue the appearance of

Copyright, Brown & Dawson, Stamford, Conn.

AVENIDA RIO BRANCO, RIO DE JANEIRO
The principal thorofare in the city

constant festivity. At its southern extremity is a group of handsome, stately edifices, among them the Monroe Palace, the great Municipal Theatre, the National Library, and the Academy of Fine Arts, all splendid examples of architecture.

The finest bay-side drive in the American continents is the Avenida Beira Mar. Commencing as a continuation of the southern end of the Avenida Rio Branco, it follows the shore of the bay for nearly four miles, with a single interruption about midway caused by the promontory of the Widow's Mount, behind which it turns inland for about 300 yards. The driveway is about 115 feet wide, splendidly paved and kept in perfect condition, lined with palms and other tropical trees, while at intervals are pretty gardens with exquisite flowers and shrubs. As an automobile driveway it is unique in the beauty of its environment. The charm of the bluish-tinted bay on one side and on the other gorgeously colored hills and high mountains, about whose bases cluster white and delicately tinted villas and handsome castlelike homes set in fairylike gardens, afford views that defy adequate description.

In addition to the new avenues a number of the old streets of the city were widened and improved.

Coincident with the public works improvements was the remarkably efficient work of sanitation under the direction of the late Dr. Oswaldo Cruz. From being a veritable hotbed for tropical diseases, such as malarial and yellow fevers, Rio de Janeiro has become one of the healthiest tropical cities of the world, with an annual death rate of only 20.4 per thousand. When it is stated that in 1894, the year the plans for improvement were getting well under way, the death rate was 38.9, it may be seen what splendid results were produced by the heroic measures inaugurated and carried out by the sanitary commission.

The Municipal Organization

The city of Rio de Janeiro and its environs constitute the Federal District of the United States of Brazil, which has a population of 933,355 and an area of 431 square miles; the city proper covers an area of about 61 square miles. The municipal organization of the district is controlled by the National Government, but the right of the inhabitants to a voice in the management of local affairs is safeguarded in two ways: (1) the district is represented in the Congress of Brazil by three senators elected for nine years and by ten deputies elected for three years; (2) there is a city council of ten intendentes, or members, elected by direct vote of the people for a term of two years, which meets in ordinary session twice a year.

The chief executive of the city is the prefect, or mayor, who is appointed by the President of the Republic with the approval of the Senate, and who holds his office for four years. Under him are seven "directorias," or boards, as follows: Public Estates; Public Works and Transportation; Health and Public Assistance; Council of Education; Forests, Gardens, Game, and Fishing; Finance; and Police, Archives, and Statistics.

Public Safety and Health

Life and property are safeguarded in the Brazilian capital thru an efficient police force of over 4,000 men and a civil guard of 600, 100 of the latter being held as reserves. There are also stationed in the city a military establishment consisting of one brigade each of artillery and cavalry, and seven brigades of infantry of the Brazilian army. The Federal District is divided, for police and civil administration purposes, into twenty urban and eight suburban districts or wards, each of which has its local prefect and other administrative officials.

The police department is under the supervision of a general staff, consisting of a commandant general, an assistant, who is a representative of the ministry of justice, an assistant of materials, an assistant of the personnel, a secretary, and an adjutant of orders. The department is divided into thirteen distinct sections: passports, licenses, and correspondence; criminal section; statistics; accountantship and exchequer; medical service, with one director and twelve assistant physicians; sanitary service, with a staff of one director, treasurer, ten permanent physicians, four chemists, one assistant chemist, one surgical dentist, one oculist, and seven temporary medical appointees; archives; detention of prisoners, cabinet of identification and statistics; treasury; harbor police; inspectorship of the corps of investigation and public safety; and inspectorship of vehicles.

Each administrative district of the Fed-

eral capital has a chief official representing the commandant general of police, besides a judge, an accountant, and several commissioners, varying in number according to the importance of the district. The entire police force is organized on a strictly military basis, and has one regiment of cavalry and two regiments of infantry.

Health conditions are excellent since the introduction of the sanitary reforms alluded to above, and the annual death rate for the last six or seven years has not exceeded 20.8 per thousand. For scrupulous cleanliness and rigid enforcement of sanitary measures, disinfection of premises where any contagious diseases have appeared, scientific eradication of mosquitoes and other germ-carrying insects, the city of Rio de Janeiro is unsurpassed by any metropolis of the world. One of the most effective features of its health department is the system of having in each urban and suburban district, or ward, a branch of the central department, in which free medical assistance and advice is given to the poor, and, whenever necessary, skilled physicians and nurses visit and take care of them in their homes without charge.

Educational Facilities

Public, as well as private, instruction is conducted under the supervision of a "General Directory of Public Instruction," and a "Superior Council of Instruction." Public instruction is divided into primary (corresponding to the primary and grammar grades of the United States), high school, and academic and university. There are about 200 primary public schools, in which are employed about 100 regular teachers with 200 assistant teachers. These are supplemented by what are known as elementary schools, which are of a private character. The latter, however, receive a subvention from the municipality on condition that they adopt the official curriculum and admit a certain number of children free. There are over 80 of these schools, with an attendance of over 5,000

THE MUNICIPAL THEATRE, RIO DE JANEIRO

pupils. The teachers are either normal-school graduates or have passed a special Government examination. To provide an adequate number of professors for the superior schools, the Federal capital maintains five "model" schools, in which teachers holding certificates and intending to become professors are trained as assistants. All such certificated teachers must gain experience under certificated professors for one year and obtain certificates under a system of competitive examination before they are made professors.

While there is no university proper in Rio, there are a number of higher institutions which confer degrees. The Polytechnic School was founded in 1810 and ranks in every respect among the best of technical institutions in the world. It offers a "fundamental course" and courses in civil, mining, industrial, mechanical, and agricultural engineering.

The city is well provided with libraries, the largest and most noted being the National Library, housed in a fine building at the southern extremity of the Avenida Rio Branco.

Utilities and Industries

Lighting, rapid transit, and motive power are exclusively furnished by the Rio de Janeiro Tramway, Light & Power Company, which derives its power from a falls about 51 miles from the city. The plant generates over 80,000 horse-power, and is splendidly equipped. It operates a fine street car system and also operates the telephone system of the city.

A good illustration of Brazilian industry is contained in the report of the investigation conducted in 1907 by the Centro Industrial, which shows that of the national consumption in 30 leading lines of manufacture three-fourths were of domestic origin.

In 1911 there were over 670 factories in the Federal District of Rio de Janeiro, and since then there has been a steady growth, especially since the breaking out of the war has made importation difficult and expensive. Each year sees new industries starting up, the great water powers of the country are being conserved and utilized, and it is perhaps the matter of but another generation when Brazil will stand among the great manufacturing nations in those lines, at least, in which it produces vast quantities of raw materials needed in the industries.

Some Legal Decisions Affecting Municipalities

Control Over Trees in Streets

Where trees planted by an abutting property owner in a street have grown to such extent that they materially interfere with the municipal sewage system, the city authorities may remove them under exercise of the police power, without the city's becoming liable in damages as for diminishing the value of the abutting property. (Alabama Supreme Court, City of Birmingham vs. Graves, 76 Southern Reporter, 395.)

✣ ✣

Kansas Street Improvements

Under the Kansas statutes which provide that assessments for street improvements shall be levied against abutting property to the middle of the blocks, blocks that have not been divided into lots are assessable to the middle, as well as those blocks that have been so divided. The fact that a block on one side of the street may be deeper than the one opposite does not affect the necessity for assessment to the middle, and such assessment is valid. (Kansas Supreme Court, Watts vs. City of Winfield, 168 Pacific Reporter, 319.)

✣ ✣

Street Surface Support

Suit by the city of Scranton to enjoin removal of coal from beneath a street, on the ground of danger of a subsidence, was properly dismissed where it appeared that the surface had been sold without any reservation of obligation on the part of the owner of the underlying coal to provide surface support, that the street was afterwards dedicated by the owner of the surface, and that the possibility of subsidence was remote. (Pennsylvania Supreme Court, City of Scranton vs. Scranton Coal Company, 100 Atlantic Reporter, 813.)

One of the Weekly Mortality Reports Published by the U. S. Bureau of the Census

Deaths (stillbirths excluded) reported during the week ending February 9, 1918, with death rates, in large cities of the United States.

CITY.	Estimated population July 1, 1917.[a]	Week ending Feb. 9, 1918.				Average of corresponding weeks 1912-1916.			
		Total deaths	Death rate[b]	Deaths under 1 year	Deaths under 1 year per cent of total	Total deaths	Death rate[b]	Deaths under 1 year	Death under 1 year per cent of total
Total for all cities	22,837,885	7,468	17.1	1,062	14.2	c	c	c	c
Albany[d]	106,632	38	18.6	3	7.9	c	c	c	c
Atlanta	196,144	78	20.7	9	11.5	c	c	c	c
Baltimore[d]	594,637	285	25.0	44	15.4	221	19.9	34	15.4
Birmingham	189,716	80	22.0	7	8.8	52	16.3	7	12.7
Boston	767,813	312	21.2	43	13.8	238	16.9	41	17.3
Buffalo	475,781	186	20.4	39	21.0	156	17.9	26	16.8
Cambridge	114,293	49	22.4	15	30.6	32	15.1	5	14.4
Chicago	2,547,201	692	14.2	112	16.2	736	16.0	141	19.2
Cincinnati	414,248	157	19.8	18	11.5	c	c	c	c
Cleveland[d]	691,251	202	15.2	32	15 8	c	c	c	c
Columbus	220,035	65	15.4	6	9.2	c	c	c	c
Dayton	128,939	54	21.8	4	7.4	41	17.2	6	14 2
Denver	268,439	77	15.0	8	10.4	70	15.0	c	c
Fall River[d]	129,828	35	14.1	7	20.0	c	c	c	c
Grand Rapids	132,861	40	15.7	8	20.0	c	c	c	c
Indianapolis	283,119	95	17.5	14	14.7	c	c	c	c
Jersey City	312,557	79	13.2	11	13.9	c	c	c	c
Los Angeles	535,485	170	16.6	22	12.9	131	15.4	13	10.2
Louisville	240,808	121	26.2	12	9.9	c	c	c	c
Lowell	114,366	45	20.5	11	24.4	34	15.9	7	20 7
Memphis	151,877	75	25.7	10	13.3	c	c	c	c
Milwaukee	445,008	98	11.5	29	29.6	109	13.6	28	25.9
Minneapolis	373,448	79	11.0	13	16.5	c	c	c	c
Nashville	118,136	48	21.2	3	6.3	c	c	c	c
Newark	418,789	127	15.8	15	11.8	113	15.1	c	c
New Haven	152,275	55	18.8	13	23.6	c	c	c	c
New Orleans	377,010	183	25.3	20	10.9	146	21.1	16	10.8
New York	5,737,492	1,769	16.1	231	13.1	1,534	15.0	240	15.7
Oakland	206,405	36	9.1	1	2.8	43	12.3	4	8.3
Omaha	167,741	38	11.8	4	10.5	c	c	c	c
Philadelphia[e]	1,735,514	729	21.9	100	13.7	543	16.7	74	13.5
Pittsburgh	586,196	232	20.6	40	17.2	c	c	c	c
Portland, Oreg.	308,399	55	9.3	10	18.2	c	c	c	c
Providence	259,895	86	17.3	15	17 4	c	c	c	c
Richmond	158,702	59	19.4	13	22 0	c	c	c	c
Rochester	264,714	79	15.6	9	11.4	c	c	c	c
St. Louis	768,630	247	16.8	30	12.1	c	c	c	c
St. Paul	252,465	53	10.9	11	20.8	c	c	c	c
San Francisco	471,023	134	14.8	10	7.5	c	c	c	c
Seattle	366,445	60	8.5	9	15.0	47	7.9	5	9 7
Spokane	157,556	28	9.3	3	10.7	c	c	c	c
Syracuse	158,514	50	16.4	10	20.0	c	c	c	c
Toledo	202,010	66	17.0	14	21.2	52	14.7	9	16.9
Washington, D C.	369,282	165	23.3	19	11.5	132	19.6	13	9.5
Worcester	166,106	57	17.9	5	8.8	c	c	c	c

[a]Populations have been estimated by the arithmetical method. Owing to recent unusual migrations of the population and to the fact that 1917 is far away from the last census year, the estimates are probably too high in some cases and too low in others

[b]These rates represent annual rates per 1,000 estimated population

[c]Not available

[d]Deaths for week ending Friday, Feb. 8, 1918.

[e]The figures for average deaths are based on statistics of 1915 and 1916

These totals, rates, and percentages permit valuable comparisons and serve as a ready health index for health officers.

Letters to the Editor

Financing War Housing

To the Editor of The American City:

In your February number you give some space to the housing problem under war conditions. All present conditions are only an accentuation of the conditions which have existed everywhere in this country for many years. If the war will help towards their solution now, it will help later. The great problem is how to do the thing so that it will not injure rather than help the workers and so that it will in every respect prove a constructive and helpful enterprise. I am convinced that something must be done, and done quickly. I agree with Mr. Ackerman in this respect, and am writing in the hope that the little I can say will possibly help towards doing something.

The standards of the war communities in England, as outlined by Mr. Ackerman, point out what I consider one of the more fundamental things to keep in mind. Whatever we do should be done properly. The areas should be properly planned, the houses should be properly located on the areas, and they should be so constructed that they may serve as a model for future construction. We have long needed excellent models. England, particularly in places like Bournville, Letchworth, Hampstead, and many others, has been doing things which serve as object lessons and which have tended to lift and help. We must do better, for example, than we have done in our cantonments. It is hardly necessary to do the thing from the purely temporary point of view. We have had temporary structures all over the country, and they have become permanent and have been used until worn out.

The program outlined by Mr. Ackerman is excellent. I would offer one caution, however, and that is not to use the "cost plus" system advised by *The New Republic* and practiced in building the cantonments, unless it is used with reasonable care. It is claimed that the contractors building the cantonments did not make enormous profits on the percentage basis. A Boston paper to-day states that about 3 per cent was the rate. If this is true, and if $250,000 was the maximum allowed in each case, it would look as tho each cantonment cost about $8,000,000. I am quite convinced that whatever they cost, the cost was too great, notwithstanding the imperative need for prompt work. It has proved very disorganizing to industry to have men taken at two, three and four times their previous wage or salary for work on the cantonments. The costs of this war are going to be great. We should pursue a careful course and not make them greater than is absolutely necessary, keeping always in mind the importance of rapid work.

Another point brought out by Mr. Ackerman I consider among the most important of all, and that is that the unearned increment be taken for community uses. In this connection those interested should study the article by Robert Murray Haig, in the *Political Science Quarterly* for March, 1917. This is a practical demonstration about which there can be little controversy. This is a war for democracy, and there is going to be no real need for making it the occasion of enormous profits for a few people. If we expect all of our people to be patriotic, they will be so. If we invite a few of them to be unpatriotic, they will doubtless be so.

It is to be doubted whether Mr. Ackerman is absolutely correct when he says that the war in England has cut clean thru the superficial layers of social and industrial conditions. I think I am not far wrong in my understanding that the taxes on idle land have not been increased for nearly three hundred years, at which time they were fixed at a merely nominal sum. When a man takes a bit of this land for a home, taxes are imposed upon his home and upon the land, whereas idle land is essentially untaxed. Has the war cut thru this condition and exposed its unfairness? I think not, because previous to the war there was in operation a system of revaluing the land of England, and that system, I am told, was stopped soon after the war commenced.

Francis Neilson recently told here of a visitor to one of the colliery villages of Wales, who complained that the people were so ignorant as to live in double shifts in houses which were packed close together, when there were abundant open fields all

about which they could use. The complainant did not know that the price of those idle fields was between five and six thousand dollars per acre. The holder of these fields paid practically nothing in taxes.

Mr. Ackerman reports that he found in England a government ready to loan enormous sums of money to municipalities for housing purposes. Where does this money come from? Too much of it comes from the little home owner or occupant who pays the heavy tax mentioned on the land and its improvements, while the large landowner alongside goes scot free. Under this system a government subvention amounts to little else than an opportunity to the employer to pay lower wages. It is the worker we are trying to help, not the employer. He is getting along fairly well.

This brings us to another difficulty with the English system of raising money for the war and probably for housing. England is taxing excess profits. She is saying practically: "You may make as much money as you want to make above normal profits, but we will take 80 per cent of it." All that the manufacturers are taking above normal profits is considered excess profits. For collecting these excess profits the Government gives to the manufacturer 20 per cent. That is a pretty good percentage for collecting easy money. These increased profits are entirely collected from the people thru a system of indirect taxation. They help complicate England's problem, and they are helping to complicate our problem. We, however, are giving most of the profits to the collectors and take very little for government uses.

While we consider this housing problem, let us not get the idea that we can lift ourselves by our boot-straps. If the Government is going to build houses, let it build them economically and let them be of good quality. On top of this we must look out for the proper financing of the enterprise. It is not going to help the working people to give them expensive homes at a cheap rental if all the additional cost after what the rental justifies is to be taxed back upon the people.

EDWARD T. HARTMAN,
Secretary, Massachusetts Civic League.

Boston, February 12, 1918.

Coöperation Between Outgoing and Incoming Municipal Officials

To the Editor of The American City:

Frequently an elected officer assumes office without having given a bit of definite attention to its problems and duties. He finds on his desk a pile of mail and in his ante-room tons of visitors wanting favors. I once heard ex-Mayor Low say to Mr. Carnegie that he never got out from under the pile of mail that he found on his desk his first day.

Wisconsin's state budget law requires that the governor-elect receive copy of all information with respect to the budget prepared by the outgoing administration, that he be invited to all budget meetings and that he be given the privilege of submitting dissenting recommendations.

The following experience indicates how the outgoing President of the Borough of Brooklyn, Louis H. Pounds, and the incoming President, Edward Riegelmann, voluntarily coöperated between election time and January 1. Former President Pounds was good enough to summarize his experience as follows:

"I have closed up practically everything that could be terminated throughout the various bureaus of this department. My local board work, improvements and all matters that could be completed have been so treated, and I am leaving the affairs of this borough in excellent shape. There are very few matters holding over, and these are such as could not be completed.

"I have had several conferences with my successor, Mr. Riegelmann, and he and I are on excellent terms. He has been made acquainted with the condition of things, so far as was necessary or best, and feels free to call upon me for suggestions and presentation of details in any matter.

"The carrying out of the suggestions you made was most proper and should be done by all officials and bureau heads. Municipal affairs go on, and those who take office thinking everything should terminate with them ought never to have been in office. I went through the campaign and created no unfriendly or uncomfortable conditions between myself and the incoming officials. I am on friendly terms with all of them and hope to give them support in their administration. I certainly wish that that administration may be successful, and that New York City, and especially Brooklyn, in which I am so much interested, may have four years of successful, progressive rule."

WILLIAM H. ALLEN,
Director, Institute for Public Service.

New York, Feb. 1, 1918.

Status of the Daylight Saving Plan

By A. Lincoln Filene

Chairman, Special Committee on Daylight Saving, Chamber of Commerce of the United States

THE country is being urged to conserve everything that is considered necessary for the existence of its people in these war times, and since the conservation of daylight will no doubt help materially in the conservation of fuel, the proposed daylight saving plan has come to be regarded as important as any of the other movements of that character.

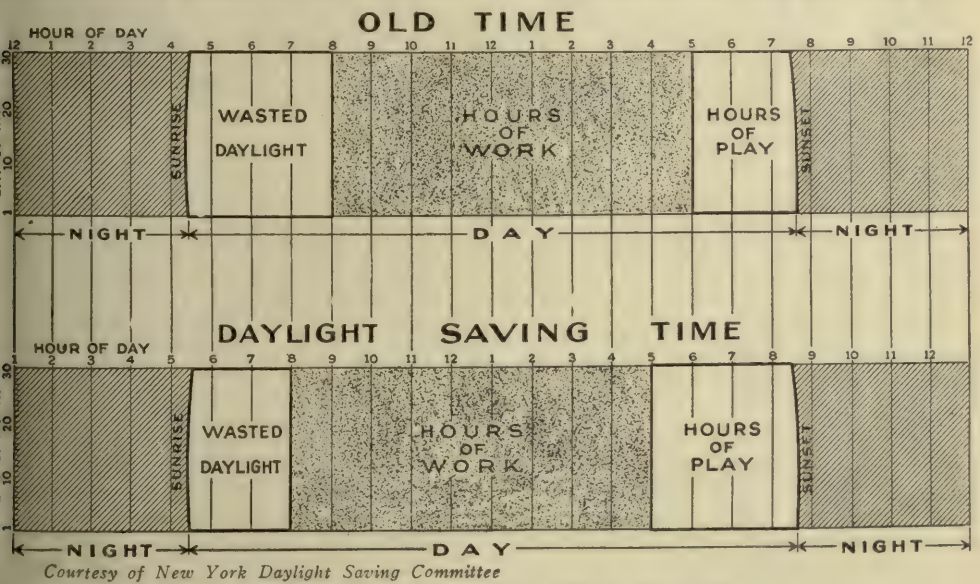
The Chamber of Commerce of the United States formally committed itself some time ago to the advocacy of the daylight saving plan on a nation-wide basis, and felt that this should be brought about thru federal legislation. A form which legislation might take is illustrated in the Calder bill (S. 1854), which passed the Senate last June and was reported to the House Committee on Interstate and Foreign Commerce in the early part of last July.

On February 9, 1918, the House Committee reported the Calder-Borland bill out favorably with two amendments: first, the months of April and October were added to the original plan, thus making it operative for seven months instead of five; and, second, the bill was made operative when approved by the President.

Dr. Garfield has advocated the enactment of the daylight saving legislation as a means of conserving fuel. Mr. Hoover urges the plan for its possibilities in extending home gardening activities during the spring and summer. Chairman Hurley, of the Shipping Board, has urged its enactment because more daylight hours will be provided for work in the shipyards. The President has several times expressed his approval of the measure. Under these circumstances, it is probable that the Calder bill, or some other such measure, will be enacted before April, 1918.

The plan, in brief, consists in setting the clocks of the nation forward one hour and saving the daylight by readjusting the hours of work and recreation to which people have become accustomed in such a way that these hours will contain a maximum of sunlight. There is no suggestion that the hours of work be either lengthened or shortened.

The Committee on Daylight Saving of



Courtesy of New York Daylight Saving Committee

DAYLIGHT SAVING IN THE MONTH OF JUNE

Thirty hours of morning daylight would be utilized and thirty hours in the afternoon, now lost, would be available for pleasure during the month of June. Similar savings would accrue under this plan during four other months.

this organization made a very comprehensive report on the subject at the annual meeting of the Chamber of Commerce of the United States, held in Washington about a year ago, copies of which may be obtained by writing to the Secretary of the United States Chamber of Commerce at Washington.

The Boston Chamber of Commerce has also studied the daylight saving plan very carefully, and the report of its Special Committee on Daylight Saving, entitled "An Hour of Light for an Hour of Night," published during the spring of 1917, is a valuable addition to the literature of the subject. In this the advantages of the proposed plan are summarized as follows:

A. Health, Morals and Social Welfare

1. One hour or more for outdoor recreation. Recreation is a national asset, an immense force for health and moral well-being.

2. Working mothers and fathers obtain an extra hour for outdoor play with their children, both summer and winter.

3. One hour less for bad lights in tenements.

4. Lessened eye-strain for workers and school children due to the use of artificial light.

5. Smaller risk of accident in industrial establishments, because there will be a light hour instead of a dark one at the end of the working day at the time of greatest fatigue and most frequent accidents.

6. Lessened risk of accident due to transportation and traffic conditions, because the afternoon rush will fall in daylight instead of in darkness.

7. Working girls will be on the way home in the daylight instead of in the dark in winter.

8. Our last hour of sleep will be sounder and more beneficial than it is under present conditions, because there will be less light.

B. Efficiency

1. General efficiency will, of course, be increased by any improvement in the health, morals and social welfare of the workers and others.

2. In summer a cool hour in the morning is substituted for a hot one in the afternoon.

3. In winter a light hour at the end of the day is substituted for a dark one. This is especially valuable, coming as it does at the time of greatest fatigue, and is peculiarly valuable in some industries where accurate eyesight is essential.

4. Efficiency is lowest in the later afternoon, the time when accidents are most frequent.

C. Economy

1. There will be the greatest of all savings —that of human materials, as pointed out above.

2. Immediate saving in form of reduction of expense for light and heat.

Courtesy of United Cigar Stores Company

A DAYLIGHT SAVING CAMPAIGN POS

3. Ultimate saving in the conservatio coal and other sources of light and heat.

4. Possible reduction in the cost of livi those who like to work in their gardens, izing the extra outdoor hour for this pu

A memorandum containing the follo important reasons for the universal tion of the daylight saving plan, looki the matter from the standpoint of our needs, was sent to the House Committ February:

1. The training of the national force be expedited, and the practice of Home G and similar organizations, the member which have other regular occupations, w greatly facilitated.

2. The production in all plants whic making materials for war use, includin shipyards, would be increased, and the tions of work for their employes would proved.

Attention is also called to the val information contained in the article en "For an Hour More of Daylight," w by Roland B. Woodward, Secretary o Chamber of Commerce of Rochester, that was published in The American in September, 1916. In this Mr. Wood gives the results of the investigation o subject made by his organization.

Civic Work of Educational Institutions

Getting the Maximum Use of Our School Facilities

By William E. Wirt
Superintendent of Schools, Gary, Ind.

N order that school administration may perform properly its function in providing suitable conditions for studying l teaching, I believe that certain standss for school administration are necesy:

. In order to offer an enriched school prom successfully, the variety of subjects to be ght by any one teacher must be limited to number that can reasonably be expected to handled by one person.

. In order to pay decent salaries, the num- of persons employed in the schools must approximately the same as the number of ular classes taught in the schools.

In order to provide satisfactory facilities, total number of individual units of accomlation provided for children in the school nt must be approximately the same as the nber of children in the plant.

. In order that sufficient time may be sed for the proper use of the school facilities, nger school day must be provided.

. In order that all child welfare agencies be able to work at maximum efficiency for welfare of the child, the school must be a ring house for children's activities.

Industrial training should be given in kshops that are productive and largely -supporting.

'he statement is frequently made that h Mark Hopkins on one end of a log a student on the other you had a unisity. I believe thoroly in the importance the teacher in the educational process. in many modern schools in our cities. h their over-large classes and poorly tilated and poorly lighted rooms, I do believe that it is possible to have a satisory school, even with Mark Hopkins a teacher. School administration must vide the physical conditions necessary the teacher to do her work successfully. o, I do not believe that Mark Hopkins a modern elementary school would be to teach reading, writing, arithmetic, history, geography, physiology, hygiene, civics, ethics, literature, music, drawing, manual training, gardening, elementary science, physical training, supervised play, thrift, patriotism, and all the other subjects in the modern curriculum.

By sending our bright boys and girls from our high schools to normal-training schools for two years, we can reasonably expect them to secure a foundation for becoming competent teachers of reading, writing, arithmetic, or competent teachers of music, manual training, history, and geography, or elementary science, but not competent teachers of everything. I am not in favor of one teacher teaching arithmetic, another teaching language, another spelling and writing in the lower grades of the elementary schools; but I do not see any objection to having one teacher teach reading, writing, spelling, arithmetic, and language to a class in the elementary school and then permitting the class to go to special teachers for drawing, music, manual training, physical training, play, etc.

I do not believe that it is possible for regular teachers properly to supervise playgrounds, gymnasiums, and swimming-pools. A teacher cannot dress properly for the playground and the classroom at the same time. The elementary teacher usually finds that it is too hot or too cold to go out on the playground with her children. For a number of years I tried to have the playgrounds in the schools under my supervision directed by the regular elementary school teachers. It seemed to me that it was a good thing physically for the regular teacher to leave the classroom and go to the playground for a recreational hour. But we were forced to give it up as an impossibility. There were always a few teach-

ers who would successfully take their turns on the playgrounds, but never more than half of the teaching force of any of the buildings.

There is a wonderful difference when the playgrounds are placed entirely in charge of specially trained playground directors. These directors know the arguments for outdoor life and playing in the sunshine. They not only believe in the theory of play and outdoor life, but also enjoy play and outdoor life, and dress appropriately by wearing heavy sweaters and heavy shoes.

Successful administration in any enterprise attempts to classify work so that each individual employe can work to the best advantage. Our efforts at the enrichment of the school curriculum are not as successful as they should be, because we are trying to make our elementary school teachers do the impossible.

When drawing was first introduced into the school, drawing teachers were employed who taught drawing direct to the children. Later it was found more economical to have one drawing teacher supervise in five or six buildings rather than teach in one. The entire supervisory system of special subjects was developed as a makeshift because of financial limitations and not because it was desired pedagogically.

The Supervisory System

The supervisory system for instruction in special subjects is not economical, even tho its supposed economy is the reason for its existence. In some states 10 per cent of the teaching force consists of supervisors, and 15 per cent of the salary budget for teaching is paid to them. These supervisors are extra teachers and are a great handicap in providing classes of reasonable size and fair salaries for the regular teachers. Regular teachers may be relieved entirely of the burden of the supervisory system, and special teachers who teach the special subject direct may be employed without employing more teachers than our average of one teacher for each regular class. Regular teachers may each take two classes for half of the school day in reading, writing, and arithmetic, and the special teachers may have these classes for the remaining half of the school day for the special subjects. Twenty regular teachers in charge of forty classes half of the day for reading, writing, and arithmetic, t gether with twenty special teachers i charge of the same forty classes the r maining half of the day for special wor will provide complete instruction for fort classes alternating between regular and sp cial work. Any type of special work ma be offered, since it does not require a extra teacher and does not burden the reg lar teachers. Thus it is much more ec nomical to employ special teachers to tea special subjects direct, from the standpoi of school expenditures as well as from th standpoint of the economy of the time ar strength of the regular teachers.

One Unit for Each Child

Our efforts at enriching the curriculu in the school are not as successful as the should be, because we are either trying t do too many things in the same room o trying to provide two, three, or more plac for each child in the school plant.

It is out of the question to make a su cessful gymnasium, workshop, music studi art studio, science laboratory, library ar social center, study and recitation room o the same classroom. If we wish our chi dren to have auditorium activities, w should provide the best auditorium that is possible to secure for auditorium pu poses alone. If we wish to provide phys cal training and play for our children, w should furnish a suitable gymnasium, swimming-pool, and a playground, in add tion to classrooms and auditoriums. Th same thing is true regarding music studio art studios, science laboratories, librarie etc.

It is not economical from the standpoi of school expenditures to make a gymn sium, workshop, studio, laboratory, ar library out of an ordinary classroom, ev tho economy is the chief reason for o trying to do so. Everyone grants that su a combination is a makeshift and interfer more or less with the instruction in readir writing, and arithmetic, for which the clas room is primarily intended. But, bad have been the results from this effort provide for a series of combination acti ties in the same room, the effort to provi gymnasiums, playgrounds, auditoriums a libraries, laboratories and workshops sep rate and in addition to classrooms has be much more disastrous.

Usually in a school plant with twelve hun-
ed children an effort is made to provide
elve hundred school seats in regular
ıssrooms, an auditorium that will seat
elve hundred children, a gymnasium and
ıyground for twelve hundred children,
d extra shops, laboratories, studios, and
rary, so that when children are in these
tivities their regular classrooms are
ıpty, or the reverse. This practice has
sulted in the collective effort of the com-
ınity providing good facilities for only a
rt of the population.

School seats for twelve hundred children,
auditorium for twelve hundred children,
ıygrounds and gymnasiums for twelve
ndred children, libraries, workshops,
ıdios, and laboratories for twelve hun-
ed, make a total of forty-eight hundred
its of accommodation in a school plant
r twelve hundred children; thus four
its of accommodation for each child are
ovided. School administration should de-
se a plan whereby it is necessary to pro-
le school seats for only six hundred chil-
en, auditorium seats for two hundred,
ıygrounds and gymnasiums for two hun-
ed, and workshops, laboratories, and
raries for two hundred. Thus a total of
ly twelve hundred units of accommoda-
n are needed for a school plant accommo-
ting twelve hundred children.

All that is required for this economy in
ıool-accommodation units is that each
ıcher of reading, writing, and arithmetic
e only one classroom for two classes. If
rty teachers are employed to teach the
elve hundred children, fifteen of them
ll teach the reading, writing, and arith-
etic to the entire thirty classes for half
the school day and will use only fifteen
ıssrooms. The classroom is the most ex-
nsive unit of a school plant. It is much
ore economical to build a gymnasium and
y a playground for six or eight classes
an it is to use six or eight classrooms for
mnasiums. The same thing is true of the
ditorium. The cost of fifteen ordinary
ıssrooms is sufficient to provide elaborate
cilities for play and physical training,
ditorium activities, studios, laboratories,
ops, and library equipment for fifteen
ısses.

Under such a plan the regular teachers
ve the undisputed possession of the
teen regular classrooms for the work for
ıich they are best suited, and the special teachers have the undisputed possession of their respective facilities planned and built for the work to be done in them. It is not necessary to provide playgrounds, gymnasiums, laboratories, studios, workshops, and libraries as extras in addition to classrooms for each class. The total number of class accommodations for classrooms, physical training, playgrounds, auditorium, laboratories, workshops, and library need not be greater than the total number of classes.

If the school is to provide the facilities for the play and physical training that children formerly had in the vacant lots, the school must have added to the school day the time that children formerly had for the vacant-lot play. If the school is to provide the child with the opportunities for hand training which the home industries and the small shops and farm of a generation ago afforded, the school must have added to the school day the time the child formerly had for the industries in the home, the small shop, and the farm.

Length of the School Day

The average city child has approximately one thousand hours a year for school and over three thousand hours a year for play in the streets. This proportion of street and school time should be reversed.

A school day of six hours in place of five can be provided without increasing the number of teachers, size of classes, or the school day of teachers. Three teachers in charge of six classes on the playground will provide a better playground than six teachers in charge of six classes. Children on the playground should have an opportunity to choose games, umpire games and take the initiative in the activities. The same is true in the auditorium. Three teachers will supervise the auditorium accommodating six classes better than six teachers will supervise it. Since during 20 per cent of the day one teacher is looking after two classes it is possible to provide six hours of supervision for children with a five-hour day for teachers. Under good conditions I believe it practicable and desirable for teachers to teach six hours and thus provide a school day of seven hours for children. To give the children all the opportunities they should have for study, work, and play it is necessary that the school administration provide a seven-hour school day in addition to luncheon time.

The providing of a child world within the adult world of the city wherein all the children may be kept wholesomely occupied all day, working, studying, and playing, should not be considered exclusively a public school problem. There are many child-welfare agencies that can do for children many things better than the schools can.

It is not necessary to have public libraries or social settlements or children's clubs enough to accommodate all the children at once after school. A seven-hour school day is desirable for children who do not have any other activities except those provided by the school. But it is not necessary to require this time of children who have satisfactory activities outside of school. The library should be working to its maximum capacity all day long. Settlements, clubs, private teachers, and churches should be doing the same. The ideal plan for providing child-welfare agencies in any community is that the total number of places provided for children in churches, libraries, social settlements and clubs, auditoriums, playgrounds, gymnasiums, school classrooms, workshops, laboratories, and studios are approximately equal to the total number of children in the community.

I admit that it is difficult to realize this ideal. But the school can serve as the clearing house for children's activities by abandoning the policy of all children doing the same thing in the same way and at the same time and same place, and thus make possible the coöperation of all child-welfare agencies.

Editorial Note.—The foregoing article is prepared by permission of the author and the National Education Association from a paper presented before the Association and published in its *Journal*.

A Hygienic Score Card for High School Pupils

The interesting device adopted in Curtis High School, New York City, of formulating all of the important hygienic precepts into a score sheet, whose aggregate is 100 per cent, presents an opportunity for health-education which might well be extended to adults. This record is begun by all physiology and biology students at the opening of the term. They are requested to check, each day, the items which they live up to, and at the end of each half-term their average for that week is recorded in the teacher's record book. This is purely voluntary, and probably somewhat less than one hundred students check these every week, but others check them for two or three weeks during the term. Pupils are not encouraged to hand in scores unless their average is 80 per cent or over. In this way the details of hygienic living are impressed on the pupils' minds. The marks are counted with their regular recitation marks and are also credited, on the 10 per cent basis, by the Department of Physical Culture. This device is considered an exceedingly efficient means of securing action on the part of the pupils. The text of the score card follows:

CURTIS HIGH SCHOOL SCORE CARD FOR HYGIENIC LIVING

Sleeping in the open or with all bedroom windows open (screened in warm weather)	10
Mattress (no feathers)	1
Small pillow	1
Bed clothing aired	1
Rise regularly at seven or earlier	2
Light exercise on rising (five minutes)	2
Cold bath, unless ill	1
Hair brushed 25 times or more	1
Teeth cleaned at least morning and night	1
Individual towel	1
Glass of water on rising	1
Hygienic Breakfast:	
Thoro chewing	1
At least one item from each of three classes of food. Class 1: fruit. Class 2: bread, cereal, baked potatoes. Class 3: eggs, bacon, milk, fish, cheese	1
No candy or other food between meals	1
No active exercise for 20 minutes after hearty meal	1
Carry books at arms' length and change hands often	
Get best possible light at school	1
Use fully 20 minutes for lunch. (Not 5 minutes eat and 40 run)	1
Hygienic Lunch:	
Thoro chewing	
At least one item from two classes. Class 1: bread and butter, crackers. Class 2: milk, soup, cold meat	
Two glasses of water in afternoon	
Vigorous exercise (tennis, baseball, running, etc.), 30 minutes	
Rest 20 minutes before dinner	
Hygienic Dinner:	
Attractive table, 1; chew well, 2; eat moderately, 2; at least one item from three classes, 5; Class 1, potatoes, bread, macaroni, rice; Class 2, soup, stew, roast, baked beans, cheese; Class 3, fruit, vegetables	1
Study two hours (read if lessons are easy)	
Light behind, above and sufficient	
Light exercise before retiring	
Retire regularly before ten P. M.	1
Glass of water before retiring	
Clean hands, face and mouth before retiring	
Hygienic clothing	
Correct posture	
Hands and finger nails kept clean	
All meals at regular times (not to vary more than an hour)	
	10

Use of coffee or tea, deduct 2 per cent.
Use of alcohol or tobacco, deduct 20 per cent.
To the best of my knowledge and belief this is correct report.

.....Parent,

Date.....19,,

FORWARD STEPS
REPORTED TO THE AMERICAN CITY BY MUNICIPAL OFFICIALS & DEPARTMENT HEADS

MAYORS

A City's Vast Watershed Park

FORT WORTH, TEXAS.—Realizing the fact that Fort Worth's supply of water from artesian wells would not be sufficient to last many years, the writer, in 1910, sought to create a lake for impounding an adequate quantity of water from the Trinity River. The valley of the Trinity is surrounded with beautiful wooded hills and has many picturesque inlets and creeks coming from the outlying plains and tablelands.

The place selected for the dam for the new lake was very narrow compared with the usual width of the valleys of the Trinity, and the dam across the river and its valley necessary to impound approximately 50,000,000 gallons of water is only about 3,500 feet long, with a maximum height of about 80 feet.

As soon as the dam was completed and the lake filled with water, the city brought the lake into its corporate limits by incorporating the pipe line from the city to the lake, and carrying the limits around its entire holdings of real estate in connection with the lake.

The waters of this lake cover approximately 6,000 acres of a total area of more than 9,000 acres owned by the city to be used in connection with the lake for parks and playgrounds.

DAM ACROSS TRINITY RIVER WHICH GIVES THE CITY OF FORT WORTH ITS 6,000-ACRE LAKE

The city of Fort Worth intends that the lands bordering the lake and owned by the city shall be held and used as a great park, and to this end has started certain lines of improvement which are intended to be carried on under the strictest rules of sanitation to protect the waters. It is expected that when the project is completed the city will have one of the most wonderful parks in the Southwest.

Summer homes and summer camp sites for individuals and for corporations and fraternal organizations are planned for; in fact, all classes are invited to the shores of the lake upon reasonable terms, always with the condition that the rules of sanitation shall be strictly obeyed.

Already many beautiful summer cottages and small club houses have been built and occupied by their owners. The Temple of the Mystic Shrine of the Masonic Fraternity is now about completing a combination club house, auditorium and home for this organization, to cost $100,000.

A road is being built along the shores of the lake, conforming to the meanderings of the water's edge, and it will, when completed, extend around the entire contour of the lake and reach a length of 60 miles.

Boating has been authorized by the United States Government, and already some of the most beautiful launches to be bought in the market are plying the waters of Lake Worth. There is among the mar boats for hire one pleasure boat that wi carry 250 people at a trip, beautiful in d sign and modern in every respect.

Another attractive feature in connectic with this lake, and perhaps the most pop lar of all, is its municipal bathing beac operated directly by the city of Fort Wort The beach is located ten miles above tl dam; it was opened late last season ar proved most popular.

Fishing is permitted under ordinances the city which prohibit the sale of any fi caught out of the waters of Lake Wort The lake is well stocked with white per or croppie, drum, black bass and chann cat, making fine fishing for sportsmen.

W. D. DAVIS,
Mayor

CITY MANAGERS

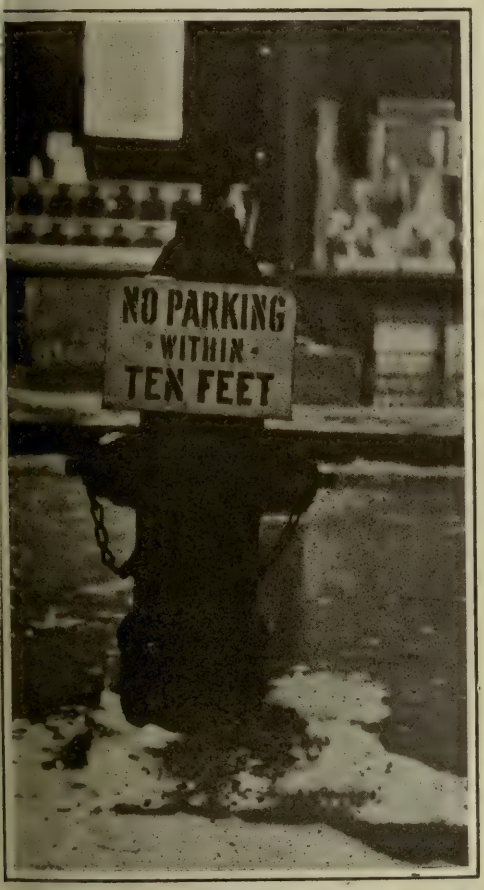
Effective Home-Made Traffic Signs and Shelter

Jackson, Mich.—Well-made, dural signs are necessary to the proper contr of traffic in modern cities. In these da when we must go ahead carefully lest overstep the limits of propriety in muni pal expenditures, nearly everyone is rea

FORT WORTH'S 9,000-ACRE PARK IS WELL PATRONIZED

nd willing to listen to a new method of roducing results with less money than eretofore. It is for this reason that I am ecording the methods used in Jackson, Iich., in the manufacture of traffic signs nd shelters.

"No Parking Within Ten Feet" of any re hydrant protects the near-by dwellings nd stores from the delay necessary to move wagon or an automobile when a fire reaks out and the engine must be attached the hydrant. The sign seen in the illus-ation is one of many similar sheet iron igns made of 16-gage black iron and ainted by the firemen in their spare minutes nd then stencilled with a warning legend. No Parking, Police Order" shows the river of any vehicle where he must not top his vehicle. These signs are also made y the firemen and have proved very effect-ial. The bases are cast at the foundry



TO SECURE UNIMPEDED ACCESS TO FIRE HYDRANT

TRAFFIC SIGN MADE BY FIREMEN

from our own pattern. The stand is simply a piece of 1½-inch gas pipe flattened at the end where the sign is riveted on. We find that they can be manufactured in this way at a much smaller cost than the market price for a similar and equally good product for the purpose.

Many cities now consider it no more than humane to provide adequate shelters for their traffic officers from the winter's snow and the summer sun. We have manufactured a shelter which houses the traffic officer as well as the signal itself. The house is 40 inches square and has 7 feet head room. The sashes are 24 by 30 inches, giving ample window space for a full view of the traffic in every direction. The roof is covered with asphalt shingles. The traffic officer enters the shelter thru a door, the knob of which can be seen at the right of the photograph. There are two irons at the front of the house, and they may be seen faintly in the illustration. There are four of these irons, and when it is desired to move the house, two "two-by-fours" are run

SHELTER FOR TRAFFIC OFFICER AND SIGNAL

thru the irons and the house is lifted readily. In cold weather a small kerosene oil stove is used to heat the house. The windows are hung on hinges at the bottom and are fastened at the top by a short length of chain, so that they may swing open conveniently.

The semaphore which is used in connection with these houses, and which is seen above the shelter in the photograph, is 14 inches square, with letters 8 inches high and 1 inch wide. These signs are made of sheet metal with the letters cut out in stencil form. Back of the sheet metal, on the "Stop" side, is a piece of red glass, while back of the "Go" side there is a piece of green glass. A light, burning a mixture of kerosene and lard oil, is placed inside the semaphore at night and shines out thru the colored signs.

This shelter and signal has turned a very disagreeable job into a comfortable, pleasant one.

A. W. D. HALL,
City Manager.

CITY ENGINEERS

The Patrol System for Municipal Road Maintenance

Laconia, N. H.—County and state highway departments have maintained their road systems in many places by the use of patrolmen, but few, if any, cities, other than Laconia, have adopted this method. We have used patrol maintenance for nearly three years now for all outlying streets and roads, with great satisfaction and economy.

These roads are in part constructed of gravel, coal ashes and cinders, but the major portion are built of the natural materials of the districts thru which they run, sandy loam and gravelly clay. Each patrolman is given from five to eight miles of road to maintain. He supplies himself with a horse and a suitable tip-cart, while the city supplies a light wooden drag suitable for one horse, picks, shovels, rakes and other necessary small tools.

Instructions are issued for the proper use of the drag, as the art of dragging is one of the most important features in this type of road protection. No two roads are identical or require the same kind of dragging, so that to obtain the best results different treatment must be given. Dragging is usually done a short time after rains, when the road is not too wet and not too dry. When not busy dragging, the patrolman rakes out loose stones, cleans and opens waterways for better drainage, and fills depressions and defective places in the road with the best available material. He is often able to resurface considerable stretches of poor road between the sessions of dragging.

In the spring, when the frost is coming out of the ground, there are many stretches of road that are badly out of shape, so that the road machines are needed to reshape them before the patrolman can readily handle them. However, after they have been once reshaped, the patrolman can keep them in condition with his drag until the following winter. It has been found in our work that roads dragged during the season require much less work with the road machine in the spring.

We have found that "good roads all the time" result from the use of the patrol system; and altho the cost is slightly in advance of that of former years when we used the gang method, the roads are in better condition at all times and are very satisfactory to the farmers and automobilists.

Personal pride in his section soon appears in every patrolman, for he is interested in the work, and everyone who travels in his section is sure to tell him how good the road is now, and how much better than it was before he took charge of it. This flattery, justly deserved, is one of the best tonics for more and better work from the patrolmen.

The patrol system was adopted in Laconia only after we had seen the admirable results obtained by the New Hampshire State Highway Department on state roads. We tried it out and were convinced that it was just as applicable to municipal roads as to state roads. We were a bit skeptical over the great things claimed for "split log drags," but, being willing to try any good roads apparatus once, we used them for a while, and now we are all convinced that the drags are the best means of keeping our roads in prime condition.

CHARLES A. FRENCH,
City Engineer.

Novel Features in Concrete Highway

Binghamton, N. Y.—New methods to save material, time and labor are appearing every day in all industries. In Binghamton we have developed two new methods in the construction of concrete pavements—the method of finishing the surface, and that of constructing the transverse expansion joints to give a smooth-riding pavement.

PREPARING TO PROVIDE EXPANSION FOR CONCRETE PAVEMENT BY MEANS OF PREMOLDED FILLER BETWEEN TWO LINES OF PAVING BRICK

In all our concrete road construction in 1916, armored expansion joints were provided, spaced at 36-foot intervals. In spite of all reasonable care in the construction, it was found impossible to finish the sections so that there would not be a slight "throw" at the joints. The repetition of this jar at regular intervals gave the impression that the road was much rougher than it actually was. In an effort to overcome the jarring, the present method of finishing the

ROLLING THE FRESH CONCRETE

concrete pavement was developed by us.

Wooden forms shaped to the crown of the street are now placed at 20-foot intervals across the highway during construction. These forms are constructed of two 2-inch planks separated by spreaders, so that the outside faces are 8¾ inches apart. The planks were used as guides for a roller made of 22 feet of 6-inch wrought-iron pipe. As soon as the concrete was placed, the roller was worked back and forth by two men, who found the space in the form sufficient to give them ample footing. The roller was passed across the fresh concrete about four times to give it a smooth finish. The finished surface, having been rolled at right angles to the line of traffic, was corrugated in low ridges, about 1/16-inch high, 2 to 6 inches long and ¼-inch wide. As these are parallel to the course of traffic, they give no jar, and they afford a greater grip to the tires of passing automobiles.

When the slabs were set sufficiently, the forms were removed and the space was carefully cleaned. A base of 3 inches of concrete and ½-inch of mortar was laid in the space, and two rows of vitrified paving brick were set at once in the wet mortar. Between the two lines of brick a 7-inch premoulded joint filler was laid, and was carried the entire width of the concrete paving. Then the brickwork was grouted to the concrete on either side of the space.

This system of finishing concrete roads and laying expansion joints has proved very satisfactory, furnishing a smooth-riding pavement rough enough to prevent skidding and with a pleasing appearance. All our concrete pavements have been laid with sufficient crown and gutter to permit the laying of a 2-inch bituminous wearing surface if it should be thought desirable.

W. EARL WELLER,
City Engineer.

- WATER - DEPARTMENTS

Municipal Enterprise Supplies Water Free for Citizens

Santa Rosa, Cal.—Some people would feel that the millennium had come if they were told that water was free to the citizens of their town. The millennium has not come to Santa Rosa, but this city has been able to eliminate water rates in a lar measure.

Santa Rosa is a city of about 12,000 pop lation and covers an area slightly over t square miles. The water department mai tains 36 miles of water mains and 184 fi hydrants. Water is pumped from wells electric pumps, with a steam reserve pla and is supplied to the city thru 2,464 ta Ten thousand gallons of water is allow each residence free each month for dom tic purposes only. A charge of 25 cents p thousand gallons is made for the seco 10,000 gallons, 20 cents for the third 10,0 gallons, and 15 cents for all above t amount. The use of 10,000 gallons p month by a residence containing six p sons means the use of water at the rate 55 gallons per capita per day.

Of the 2,464 taps in the city, 2,108 a metered, with free allowance; 29 are churches, parks and public buildings w

NEW WELL AT PUMPING STATION, SAN ROSA, CAL.,

940 feet deep; flowing about 500,000 gallons per

ONE OF THE WELL-WATERED HOME GARDENS IN SANTA ROSA
The residence of Luther Burbank

unlimited free allowance; 38 are metered, and all water used is paid for; and there are 289 unmetered services which pay a flat rate. For the last fiscal year the churches used about $1,749 worth of water free, and the fire hydrants, which are maintained free of cost to the city, would have brought an income of $954 if charged at the rate of $60 per year.

The finances of the department are as follows: cash receipts were $5,649 for last year with a total credit of $8,351; the total debit was $10,216, which leaves a deficit of $1,865, or less than $1 a year for each residence receiving free water. In addition to the above, $10,885 was required to meet the interest and sinking fund charges; this would increase the cost of free domestic water to about $6 a year for each tap. The deficit is made up by transfer of funds from the general fund.

Santa Rosa is considered one of the garden cities of this district, and most of the claim to this title may well be credited to the free use of water for lawns and gardens, made possible by the system outlined above.

D. W. COZAD,
Superintendent of Water Works.

FIRE DEPARTMENTS

Telephones for Fire Alarm Signals

Fort Smith, Ark.—The city of Fort Smith has a population of 35,000 and has no fire alarm system similar to those in other cities, but instead makes use of a unique arrangement for alarms. The fire department maintains a private telephone system with a switchboard located in the central fire station and with direct lines to each engine house, the standpipe and the pump station.

In addition to this, there are twenty telephones maintained in the business district of the city and connected directly with our board. These telephones are placed in boxes on the telephone poles. The telephone company and fire department switchboards are connected by two trunk lines; 1212 is exclusively a fire alarm telephone, and all citizens are well aware of this fact. When this number is called, the telephones

at all the stations ring simultaneously, but when the central station plugs in, no other telephone can hear the conversation. After receiving the location of the fire, the department operator notifies the other stations. It would be possible for all stations to hear the location of the fire at the same time, but with the chance of five people talking over the wire at once there might be many serious mistakes.

During a strike of the telephone operators of the city, the fire alarm system as described was completely paralyzed. During this period and before any arrangement could be made with the telephone company, the city was divided into districts and constantly patrolled by men on motor cycles, who notified the central office and the nearest station as soon as any fire was located. This scheme was only temporary in character and was supplanted by an arrangement with the telephone company by which about two hundred telephones, widely distributed, were cut into one position on the telephone board and used for fire alarm purposes only.

M. J. BRUN,
Fire Chief.

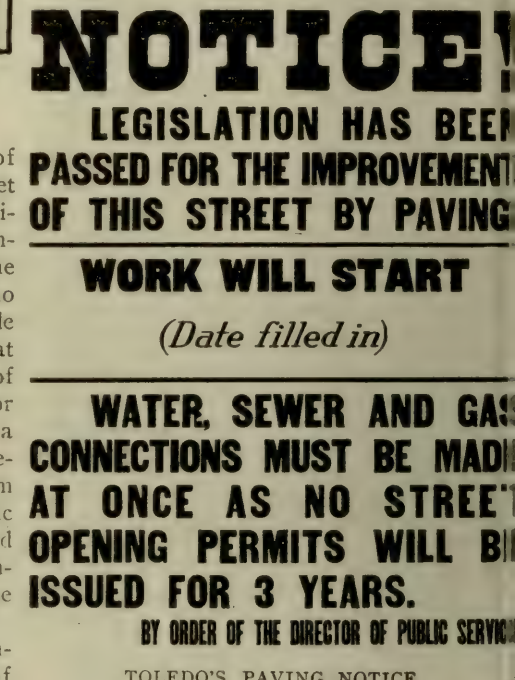
PUBLIC WELFARE - AND SERVICE -

Toledo Reduces Pavement Patches

Toledo, Ohio.—The present policy of Toledo in the matter of controlling street openings has worked well since the municipal ordinance has been more rigidly enforced. The ordinance has been on the record books for a number of years, but no serious attempt at enforcing it was made until recently. The ordinance states that no permit shall be given for openings of any kind in street pavements, except for leaks, within three years of the laying of a new street surface. Any permit for repairs caused by leaks must be obtained from and be signed by the Director of Public Service. All excavations must be filled with sand, and a fine of fifty dollars is imposed for failure to follow the ordinance regulations.

We have made a vigorous attempt to enforce compliance with the regulations of this ordinance, and in a number of instanc have been able to accomplish a great de of good. It is the intention of the depar ment to keep public utilities and other ci departments from entering the paveme within five years of the time it was laid, this is the length of the guarantee require from the contractors. Now the departme is trying to secure the passage of an ord nance which will impose another fee, addition to the present fee and replaceme charges, on all openings made for any re son before the expiration of the five-yea period.

On new paving work we endeavor to s cure the coöperation of owners of abuttin property, and especially owners of vaca abutting property, in installing service co nections before we begin work. The ma ter is called to the attention of the owne by post card notices. Beginning this sprin additional notice will be given thru the u of large pasteboard signs tacked at vario points along the streets affected. The signs measure about 22 by 28 inches; o is reproduced in reduced size below. Whe no attention is paid to the post card an street notices, the department orders a co tractor to install the necessary sewer co nections while the Water Department i



TOLEDO'S PAVING NOTICE

ls the water connections. Unfortu-ely, at present we cannot require the gas pany to make this preliminary expendi-, but for the most part their lines run er the sidewalk area and no street open-is necessary to make the tap.

n the case of older pavements, it is im-sible to completely eliminate the matter opening pavements, not only on account new connections, but also because of s in the old gas lines and water lines. wever, the department feels that even his late date the advance installation of vice connections is a distinct forward . People are penalized for making the nings by being required to backfill with d, screenings or gravel. In addition, as ntioned above, they are required to pay the pavement replacements. These ches are not as smooth as new continu-pavement, for, seemingly, patches can er be laid as evenly as new pavement, h the possible exception of concrete.

One difficulty encountered is the necessity opening comparatively new pavements to tall connections desired by purchasers of perty who were ignorant of the fact t connections had not already been made. ru publicity it is hoped to do away with st of this type of trouble, as well as with general objections to payments for ening permits and for pavement replace-nts.

The new system has been in force for ly one year and we now have far less trouble and fewer complaints than when the ordinance was first enforced.

HARRY C. McCLURE,
Commissioner of Engineering and Construction,
Department of Public Service.

EDUCATION - DEPARTMENTS

Open Air Schooling

JACKSONVILLE, ILL.—The Jacksonville Open Air School was recently reopened in its new location between West State and West Morgan Streets. The plant consists of two buildings—the open air school proper and an adjoining office and utilities center. These buildings are joined by a covered passage way. The exterior and interior of both are finished in blue white, and everything has been made of sanitary, clean appearance.

The open air school proper has been enlarged so that its present floor dimensions are about 30 by 50 feet, accommodating between fifty and sixty pupils. This building has adjustable windows on all four sides, so that a controlled low temperature may be maintained at all times of the year without exposure to extremes. To further aid in this control, steam coils have been placed under the floor, so that it may be kept at any desired temperature, and a large radiator in the middle of the room provides for emergencies in extreme cold

BUILDINGS OF THE OPEN AIR SCHOOL IN JACKSONVILLE, ILL.

weather. The sloping roof extends out 4 feet beyond the building, and there is a complete set of openings just under these projections which, being absolutely protected from the weather, remain open even when all else is closed. The adjustable windows which replace the duck curtains make it possible to close and lock the school.

At present two teachers, a housekeeper and a nurse are in charge of the work at the school.

Children who are found by the city public school nurses to be deficient in health, with tubercular family history or tendencies, or anemia, are assigned to this school by their family physicians or by the physician of the Morgan County Anti-Tuberculosis Clinic. All cases are subject to the final approval of the Superintendent and the Board of Education. Pupils remain in the school as long as the weekly nurse examinations, the clinic, or other checks seem to show a need for the treatment. Open cases of tuberculosis are not permitted in the school, and are provided for by the Morgan County Anti-Tuberculosis Sanitarium. This is in conformity with the best medical practices, inasmuch as such patients would expose others, and, furthermore, they have no energy to use in study. The school is primarily a health school in the large sense.

The children assemble in the morning at regular school time and remain for the full day. A lunch consisting of breakfast food or cocoa and crackers, and bread and milk is served at 9.15. Dinner at 12.15 consists of vegetables and meat with warm milk. The cost of feeding the children was 1 cents per day per pupil for the last year.

The school is carried on officially thru the Board of Education, with the coöperation of the Morgan County Anti-Tuberculosis Association and the unqualified support and aid of many other local organizations. At present the Board of Education is furnishing the quarters, teachers, housekeeper, nurses and school equipment. The Morgan County Anti-Tuberculosis Association thru the Glackin Tax, is furnishing food and such equipment and supplies as are technical health measures. Many supplies are provided by other coöperating agencies.

WELL-WRAPPED FOR FRESH-AIR WORK

It was necessary to limit the number of pupils to the accommodations available, consequently only the cases that would profit most were entered in this school. In 1915, 40 pupils were cared for; in 1915-16, 47 cases; in 1916-17, 48 cases. There were

enrolled in December, 1917, 52 cases, as it was possible to accommodate this larger number in the new quarters. This enrollment includes pupils who have been in the school more than one year. The following table gives the *new* pupils per year: 1915, 40; 1915-16, 19; 1916-17, 31; 1917-18, 17; total, 107 different pupils.

No better recommendation for the work of the school is to be found than the later records of these pupils. Of the 90 who were enrolled previous to this year, 21 moved away, 32 returned to regular school, 3 went to work, 2 died after leaving school, 1 was dropped (not of school age), 29 are still in the school, and 2 are still to be examined.

It is significant that the attendance of the children assigned to the open air school was greatly improved. In many cases where the record of previous attendance showed an absence of from fifty to seventy days per year, the record in the open air school was almost perfect.

H. AMBROSE PERRIN,
Superintendent of Schools.

PARK DEPARTMENTS

Building a Park on Hard Blue Clay

WILMETTE, ILL.—The story of the building of a park on the spoil pile of the new drainage channel of the Sanitary District of Chicago by the use of Nature's own forces and some ingenuity is truly remarkable. Wilmette has accomplished this in the last three years.

Some years ago, in excavating for a drainage channel from Lake Michigan at a point in Wilmette down thru Evanston to join the north branch of the Chicago River, the Sanitary District of Chicago was required by its contract with Wilmette and Evanston to remove all the spoil from these villages. In acquiring the right of way for the channel, it was found necessary to take over certain frontages with riparian rights adjoining the intake of the canal. From

this point a breakwater was built far enough into the lake to take care of all the spoil from the sections of the channel thru the two towns mentioned. In this way about twenty acres of land was reclaimed. The top of the twenty acres was the bottom excavation of the channel and was hard blue clay. The wonderful location of this filled ground jutting out into Lake Michigan about 400 to 500 feet beyond the main shore line and extending about 1,300 feet north and south, suggested to the minds of the Park Commissioners the idea of transforming it into a park. After negotiations with the Board of Trustees of the Chicago Sanitary District and the passage of an act by the Illinois Legislature, the area was turned over to the Park District of Wilmette.

To lay minds, the difficulties presented in this tract of land were insurmountable: A barren pile of clay incapable of raising a spear of grass, and series of valleys and ridges with maximum ranges in elevation of fifteen to twenty feet. The estimated cost of improving the tract by covering it with black dirt was about $40,000.

After consultation with a Chicago expert on soils, it was decided to give the land a three-years' treatment without the addition of black dirt. This was deemed sufficient to produce an amount of fertile soil capable of bearing a good lawn.

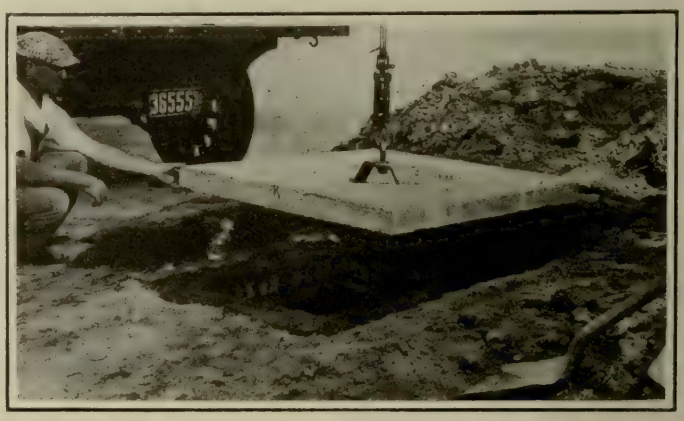
The first plowing of the area was carried out with a road-breaking plow with three teams and with men to weight down the plowshare. The last plowing, which was completed this fall, was done with a medium-sized farm team and an ordinary farm plow, manipulated by one man. The surface for at least four inches is mellow, reasonably dark-colored, friable soil, and, according to the Department of Agronomy at the Illinois State University, is capable of bearing almost any kind of crop.

The methods used to accomplish this remarkable change consisted of plowing and grading, each time applying straw manure and keeping the pieces of clay spread so that the sun, rain and frost would penetrate as deep as possible. Added to this was deep pulverizing with a disk harrow and working with special tooth drags and levelers. Two crops were planted each year and plowed under in the summer. Field peas and oats were used, as they provided part of the seed for the next year, and in addition millet, rye, sweet clover and cow peas were planted. The thickly matted tops of the pea crops furnished the chemical properties which the soil needed. The deep roots of the clover crop tended to break up the soil to a greater depth.

The grading of the park area has been accomplished thru the use of a road grader and a disk harrow. Into the furrows left by the disk, pulverized limestone is put by means of a street sand spreader. This has a tendency to sweeten the soil. In addition to this, fine-straw stable manure will be put on, using a manure spreader equipped with a chopping device. All that will be necessary next spring will be to run over the grade with a street sweeper, after which the seed will be put in and covered by going over the grade lightly with rakes.

By the use of this method, using a minimum of new material and a maximum of Nature's own supplies, the entire cost of providing a park capable of bearing grass has been only $5,000, including the grading, against the estimated cost of $40,000 if black soil had been used.

The lighting system for the park is already installed, and the work on the water and drainage systems is progressing. Nur-



SETTING 52-INCH SLAB ON TOP OF SQUARE MANHOLE AS DESCRIBED ON PAGE 235

sery stock is being planted during the fall so as to be in good condition when spring comes.

BENJ. E. GAGE,
Landscape Advisor.
Superintendent of Parks for Wilmette, Ill.

New Scheme in Manhole Construction

24-INCH ROUND FRAME GROUTED DOWN

COVER PLACED AND SODDING COMPLETED

Chicago, Ill.—In the standard construction of manholes it has been the custom for many years to reduce the size of the manhole by building a rounded neck at the top. A method which involves a material saving over this type of construction has been devised for the use of the electrical department of the Lincoln Park Commissioners in connection with their underground cables. A premolded reinforced concrete slab, as shown on page 234, is used on top of each square manhole instead of drawing in the brick walls from the square shape to a circular plan to fit the cast iron frame of the standard manhole cover. These reinforced concrete slabs measure 52 or 58 inches square, according to use, and are 3 inches thick. In placing them over the completed square manhole, a small jib crane attached to the rear of a 5-ton truck is used. After the placing of the slab and the cast iron frame, earth is shoveled over the slab and sod is packed flush with the 24- or 28-inch by 32-inch cover.

Slabs of the size stated above are used on all manholes from 2 to 4 feet square. By standardizing on this size of slab we have been able to materially reduce the cost of the slabs, as they may then be made by our shops in larger quantities, with the consequent reduction in unit cost. The standard slab costs $3, with an additional cost of about $1 for placing it. This charge of $4 for the finishing of a manhole is far less than the cost of laying the circular section of the manhole as formerly done, for the reason that only the best of masons can perform the latter work with good results and much time is consumed in such work. Moreover, if the location of the manhole is to be changed, the slabs are salvaged and used again, whereas the bricks are usually so broken in wrecking the manhole that they are of little use for further construction.

C. H. SHEPHERD,
Electrical Engineer, Lincoln Park Commissioners.

HEALTH DEPARTMENTS

Clergymen Aid Birth Registration

Oakland, Cal.—Health officers in all parts of the country are making every effort to increase the registration of births in

HEALTH DEPARTMENT
CITY OF OAKLAND, CALIFORNIA

BIRTH REGISTRATION

Name .....

Date of Birth .....

Address .....

Name of Father .....

Name of Mother .....

Doctor or Midwife } .....

RETURN THIS REPORT BEFORE THE 20TH OF EACH MONTH TO THE HEALTH OFFICE, CITY HALL

Health 120—9-17

BIRTH REGISTRATION CARD, OAKLAND, CAL.

their cities. There are many methods of going at this work which have proved successful; ours is offered as one new scheme that has been of help in Oakland and may prove of value elsewhere.

Even the best of physicians and midwives are frequently delinquent in reporting births in the proper manner. For that reason there are a great many unregistered births each year. Most of these children are baptized in the local churches within a year of birth. All churches keep baptismal records containing the names of the parents and children. In carrying out our plan in Oakland, personal visits were made by deputies of the health department to all the churches, and copies were made of the church baptismal records. These records were compared with the reported births in the department files, and the cases in which reports had not been made to our office were taken up in order that proper certificates might be obtained.

Cards like the one reproduced above on this page were left with all clergymen, with the request that the records of all future baptisms be entered thereon and sent to the health department offices or held to be called for by our deputies.

This has been the means of increasing our birth registration approximately 10 per cent, and we believe that with the coöperation of the ministers and the priests we are receiving reports of very nearly all the births in the city.

KIRBY B. SMITH,
Health Officer.

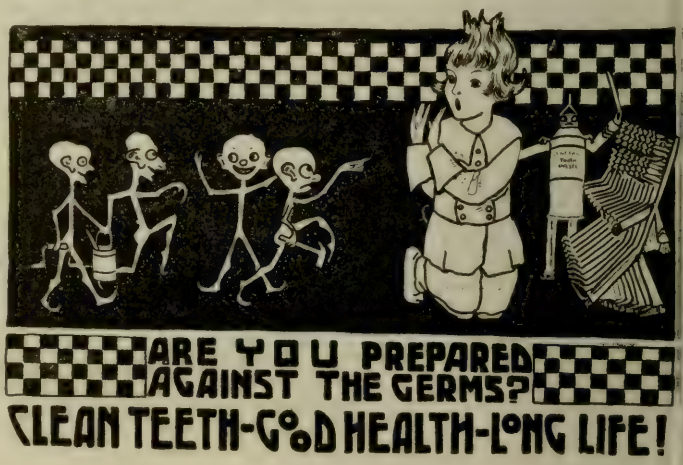
Health Posters by Public School Students

NEW YORK CITY.—The public schools are the most effective publicity vehicles in the country. They receive only to dis-

HEALTH DEP'T "LIFE LINES"
No. 2

Become a fresh-air crank, even at the risk of being disliked. Better a live fresh-air crank than an almost lifeless hot-house invalid

DEPARTMENT OF HEALTH, CITY OF NEW YORK



tribute. It is a trite truth that the parents and others in the homes are most directly reached thru the school children. To these young students, of late years, have been given various civic tasks, the results of which have been of real value to their communities. Among the plans for turning classroom work to community benefit is one evolved by the Bureau of Public Health Education of the New York City Department of Health.

This is a poster age. The people have grown accustomed to responding to the direct appeal of the placard, and some of the best talent in the country has been employed in developing this appeal. Valuable training, this, for our young art students. The Bureau of Public Health Education has enlisted the coöperation of the students of the art classes of the city's high schools and colleges in the preparation of posters to aid in spreading health doctrines.

Excellent posters have already been secured dealing with open windows, dental hygiene, fish as food, etc. Some of them have been reproduced in the *Weekly Bulletin* of the Department of Health. On page 236 are reproduced two of the most interesting posters. The one on "Clean Teeth" is by Edna Rosenthal, of Hunter College.

CHARLES F. BOLDUAN, M. D.,
Director, Bureau of Public Health Education.

An Anti-Spitting Crusade

Chicago, Ill.—Indiscriminate spitting is an inexcusable, vicious habit. It is a dirty, disgusting, dangerous habit. Most people have it.

In spite of education, admonition, instruction and penal ordinances, most people spit indiscriminately in public places.

For many years there has been an ordinance on the statute books of the city of Chicago forbidding spitting in public places and providing a penalty therefor. From time to time there have been sporadic and short-lived crusades against this spitting habit. Spitters have been arrested on public streets and in public vehicles. And, following these arrests and the consequent publicity, there has been a noticeable diminution of indiscriminate, dangerous spitting. Out of the many thousands of spitters, a certain percentage of them are consumptives; a certain number are carriers of pneumonia germs. Their spittles are charged with the germs of consumption, pneumonia and other contagious diseases. This means that indiscriminate spitting causes the spread of these diseases. For many years the people of the city of Chicago have been familiar with this short and simple slogan:

"NO SPIT; NO CONSUMPTION."

Yet people continue to spit and thereby spread contagious diseases.

Because of this lamentable condition of affairs, I conceived the idea of emphasizing in a popular way the evils of indiscriminate spitting. An employe of the Department of Health, properly uniformed and equipped with a disinfecting apparatus, paraded the streets of the down-town district, followed up indiscriminate spitters, disinfected their spittle after it lodged upon the sidewalk, and handed to the offenders and nearby spectators warning cards, warning them against spitting. Here is the card:

WARNING

Pneumonia, consumption and other diseases are conveyed in *spit.*

Please do not *spit* on the *sidewalk* or in other *public places.*

It is against the *law* to do so.

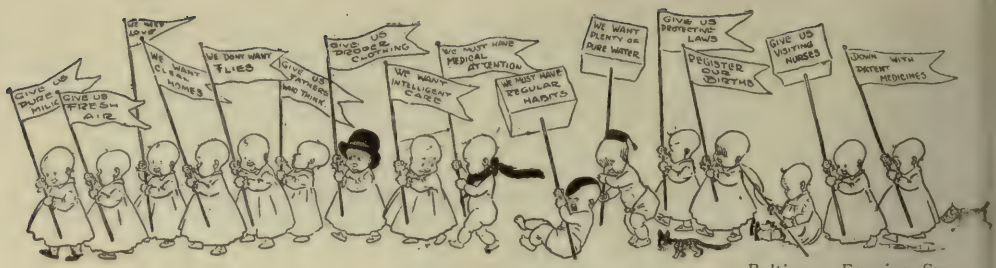
For *each offense* the penalty is a fine of *one* to *five dollars* and *costs.*

Join the anti-spitting crusade.

John Dill Robertson,
Commissioner of Health.

Just as a starter, one hundred thousand of these cards were printed for distribution. The object lesson was very impressive and has undoubtedly had a widespread influence. This is being followed up by an educational campaign in the *Bulletin* of the Chicago School of Sanitary Instruction, and in the daily papers.

JOHN DILL ROBERTSON, M. D.,
Commissioner of Health.



Baltimore Evening Sun.

A Campaign to Save 100,000 Babies as A War Measure

By Mrs. Harold S. Buttenheim

Chairman, Child Welfare Department, New Jersey Division, Woman's Committee of Council of National Defense

THERE are many specious brands of patriotism on the market. They appear so rapidly and in such numbers that it is almost impossible to keep the public informed of the latest fraud. There is the merchant, with the American flag flying above his door and a service flag in his window, who sells shoddy goods at high prices to our soldiers; there are the Washington hotels, with their corridors profusely decorated with our own and the flags of our allies, patriotically rendering the Star Spangled Banner each evening and charging outrageous prices to the men who go down to Washington on the Government's business; there are real estate owners of land in the vicinity of our cantonments who patriotically boost their rents several hundred per cent to the people of the state who are trying to provide our men with healthful recreation—all of them talking loudly of how we must "help win the war."

But the most dangerous kind of imitation patriotism, the most difficult to detect, is the kind that proposes to rob Peter to pay Paul in the name of "economy." We are going to hear of the cutting down of appropriations for sanitation, health officers, district nurses, playgrounds, schools, etc., because "we must economize to help win the war." In order to help our boys at the front we are going to kill off several hundreds of babies at home! Our boys at the front are not asking of us this kind of patriotism. Nor is it what our Government asks of us. In a recent address, the Secretary of War said: "We cannot afford, while losing our boys in France, to lose children at home. With the great drain we shall suffer in France because of the casualties of war, we cannot afford a great drain upon the nation here at home because of the devitalizing of our youth."

The war puts a premium on the life of every child, and yet there are indications that many of our communities are going to take less care of their children than usual. One does not like to think that it is necessary to use the war to force people to do what they ought to do in times of peace, but if the loss of our youth on the field of battle will wake us up to the iniquity of unnecessary loss at home thru ignorance, indifference and neglect, let us by all means use the argument. Dr. Allan McLaughlin, Commissioner of Health for Massachusetts, says:

> "In a time of national stress, such as accompanies the present war, with the loss of man power, the importance of baby-saving is tremendously accentuated. It has been demonstrated abroad that by intensive methods of child conservation enough lives of babies can be saved, over and above those saved by ordinary methods in time of peace, to go far toward replacing in a few years the man power lost because of war."

On top of this statement read the report of the Federal Children's Bureau, that last year, in this country, 300,000 infants under five years of age died, and most of these deaths were preventable. When we have lost 300,000 soldiers on the field of battle, this country will be in mourning. Yet we

e going to find appropriations commit-
es in the cities and in the state legisla-
res cutting down funds to child-caring
;encies on the ground that we must econo-
ize to "help win the war." What dif-
rence does it make whether the Ger-
ans kill our children by bullets or we kill
em by neglect? They are just as dead,
ıst as irreparable a loss to the nation.

The Federal Children's Bureau an-
ɔunces that in coöperation with the
'oman's Committee of the Council of Na-
ɔnal Defense, and therefore with the
·incipal women's organizations of the
ɔuntry, it is preparing plans for a child
elfare campaign for the second year of
merican participation in the war (April 6,
)18-1919). The Bureau states that public
:alth authorities agree that if children
ere well born and well cared for there
ould be practically no deaths of babies.
hree hundred thousand American children
ıder five die each year. Authorities also
·ll us that most of the fifteen thousand
ıothers who died last year died needlessly.
:is believed that one hundred thousand
ves can be saved this year, notwithstand-
ıg the withdrawal of a large proportion of
octors and nurses for war service.

In order that each state may feel re-
ɔonsible for a definite number of lives to
e saved, quotas have been assigned to the
arious states, the apportionment being
ıade on the basis of the population under
ve according to the 1910 census. This, of
ourse, cannot take account of the varying
eath rates in the different states where
eath rates are known.

The state councils of defense and the
tate women's committees are called upon
ɔ be responsible for the state quotas. The
ctual methods by which those lives are to
e saved are briefly described by the Chil-
ren's Bureau as follows:

First: The registration of births so that
here may be an immediate record of every
hild born; and nursing and medical skill may
e provided wherever family income does not
ermit its being secured independently.

Second: For every mother prenatal care,
:ecessary care, of doctor and public nurse at
onfinement, and after-care.

Third: Children's conferences where well
ıabies can be taken periodically to be weighed
.nd examined, and clinics where sick children
nay be given medical advice.

Fourth: The organization of state and city
livisions or bureaus of child hygiene.

Fifth: The guarding of the milk supply, that every child may have his quota of clean, pure milk.

Sixth: An income making possible decent living standards.

As a test of child welfare, to inaugurate the Children's Year, a nation-wide weighing and measuring of babies and children of pre-school age is proposed by the Children's Bureau. The Bureau will provide a record card which will be arranged in duplicate so that one half can be sent in to the Children's Bureau and one half kept by the parents. The record will be filled out by physicians and nurses in many places; but if parents cannot take their children to an examining station, they can secure cards and make the record themselves. The record card will show the fair standard for children of a given age, and parents can judge for themselves where their children stand. Should there be any great divergence from this standard it is a warning that the children's health should be carefully looked after. The records will all be gathered and tabulated by the Bureau.

Weighing and measuring should begin as soon as possible after the sixth day of April, and should be concluded within sixty days. It has been suggested that where Baby Week celebrations of any sort are to be held, the last six days of this period, being the first six days of June, should be taken for Baby Week.

The quotas assigned to the various states are as follows:

Maine	676	West Virginia	1,591
New Hampshire	372	North Carolina	3,130
Vermont	321	South Carolina	2,149
Massachusetts	3,094	Georgia	3,543
Rhode Island	509	Florida	912
Connecticut	1,056	Kentucky	2,770
New York	8,455	Tennessee	2,771
New Jersey	2,511	Alabama	2,932
Pennsylvania	8,318	Mississippi	2,442
Ohio	4,510	Arkansas	2,170
Indiana	2,592	Louisiana	2,108
Illinois	5,625	Oklahoma	2,275
Michigan	2,808	Texas	5,070
Wisconsin	2,410	Montana	360
Minnesota	2,134	Idaho	380
Iowa	2,220	Wyoming	144
Missouri	3,391	Colorado	777
North Dakota	775	New Mexico	425
South Dakota	691	Arizona	233
Nebraska	1,318	Utah	496
Kansas	1,802	Nevada	60
Delaware	188	Washington	1,023
Maryland	1,295	Oregon	566
Dist. of Columbia	251	California	1,822
Virginia	2,529		

One of the greatest dangers to our babies and little children just now is that of underfeeding, owing to the high price of milk and cereal foods. It is not likely that we shall hear of any cases of children

Courtesy of Educational Exhibition Co., Providence, R. I.
FOUR PANELS FROM A BABY CARE EXHIBIT

dying of actual starvation, but more children will die of infant diseases because their resistance has been weakened by insufficient nourishment.

Take the recent investigation of the Mayor's committee on milk in New York: 2,200 families, all with children under six, were investigated, and in more than half of them tea and coffee had been substituted for milk. This means that those children were getting stimulants instead of blood-making food. In 120 families milk had been stopped entirely, and in twenty-five of these families there were babies under one year old. A very intelligent woman recently said that she did not think mothers would deprive their children of milk, "no matter how high the price was." There is such a thing as ignorance of food values, even on the part of mothers, and there is such a thing as extreme poverty where fourteen cents is almost insurmountable.

Both the ignorance and the poverty can be overcome, but it means that the whole country must wake up to the importance of the value of each child life to the nation.

How about it in your town? How many babies do you propose to kill off this year to "help win the war"? It comes right down to this, and you might as well face it and call it what it really is—a kind of refined American atrocity.

The community that dispenses with its district nurse, cuts out milk inspection, closes its playgrounds and drops a few health officers off the pay-roll, may choose to call it "economizing," but it is killing babies, by that or any other name, and *it won't win the war.* If anyone has doubts about this, he is respectfully referred to the War Department.

On the Calendar of Conventions

MARCH 6-8.—MOOSE JAW, SASK.
Saskatchewan Association of Rural Municipalities. Annual convention. Secretary, E. G. Hingley, Regina, Sask.

MARCH 13-14.—CENTRALIA, WASH.
Washington Association of Commercial Organization Secretaries. Semi-annual convention. Secretary, Walter B. Slade, Hoquiam, Wash.

APRIL 10-12.—CHICAGO, ILL.
Chamber of Commerce of the United States of America. Annual meeting. General Secretary, Elliot H. Goodwin, Riggs Building, Washington, D. C.

APRIL 15-17.—LITTLE ROCK, ARK.
United States Good Roads Association. Annual convention. Secretary, J. A. Rountree, Birmingham, Ala.

APRIL 24-26.—PHILADELPHIA, PA.
American Institute of Architects. Annual convention. Executive Secretary, E. C. Kemper, The Octagon, Washington, D. C.

APRIL 26-27.—PHILADELPHIA, PA.
American Academy of Political and Social Science. Annual meeting. Secretary, J. P. Lichtenberger, Logan Hall, West Philadelphia, Pa.

APRIL 28-MAY 8.—HOT SPRINGS, ARK.
General Federation of Women's Clubs. Biennial convention. Corresponding Secretary, Mrs. Francis D. Everett, Highland Park, Ill.

MAY 6-8.—CLEVELAND, OHIO.
National Organization for Public Health Nursing. Annual convention. Secretary, Miss Maud Reeder, 571 West Fourth Street, Dubuque, Iowa.

MAY 13-17.—ST. LOUIS, MO.
American Water Works Association. Annual convention. Secretary, J. M. Diven, 47 State Street, Troy, N. Y.

Modern Electric Street Lighting

A Discussion of Incandescent and Arc Lamps from the Standpoint of Illumination

By S. L. E. Rose and H. E. Butler

THE earliest form of street lighting consisted of lamps placed in the windows of houses for certain specified hours each night, and probably the first street lighting company on record was organized by an Italian abbot, Landati Caraffa, in Paris, about the sixteenth century, whereby torch bearers were furnished to guide people thru the streets at night, for which a fixed charge per hour was made. The next development was street lanterns, and as early as 1745, it is said, reflectors were used on these lanterns.

In 1879, Thomas A. Edison perfected the electric incandescent lamp, and shortly after lighted the roads and paths at Menlo Park, which was probably the first incandescent electric street lighting system in this country. It was not until about 1900, however, that incandescent electric lamps were extensively used in street lighting.

About 1880 Thomson brought out the open arc, which gave a great impetus to street lighting by electricity. This was followed by the enclosed arcs, which were placed on the market about 1895 and marked a step forward in electric lamps for street lighting.

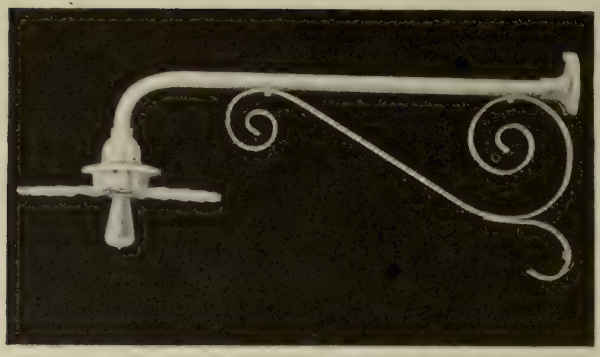
In 1905, the luminous or magnetic arc lamp was developed; this was a distinct advance both in efficiency and light distribution. The improvement since that time has been mostly in electrodes and minor changes in the lamp itself.

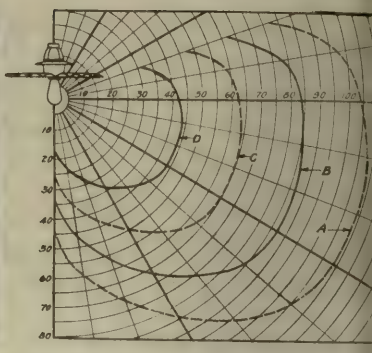
It was about 1908 that tungsten filament lamps were first used for street lighting, and the growth since that time has been rapid. In 1911 the tungsten filament, or Mazda, lamps, as they are now called, were available in sizes up to 350 candle-power, while in 1916 lamps of 1,000 c. p. were in common use, and to-day 1,500-c. p. lamps are being used in some places. A study of the advances in efficiency made both in incandescent and arc lamps shows that the enclosed flame arc is slightly higher in overall efficiency than the luminous arc. In street lighting, however, overall efficiency is not always the deciding factor. Other factors, such as maintenance, operation, candle-power distribution, and available accessories, such as the prismatic refractor, etc., enter into the problem, with the advantage in favor of the luminous arc or Mazda lamp. Very few systems of street lighting with flame arc lamps were ever installed in this country, and this lamp is now practically obsolete as a street lighting unit. Furthermore, the flame arc was available only in one size, and, therefore, adapted for only one class of lighting where large units could be used.

So long as incandescent lamps were not available in large candle-power units, the arc lamp had no serious competitor for street lighting. With the advent of the large incandescent series lamps, however, conditions were changed, and to-day units suitable for all classes of street lighting are available in both arc and incandescent lamps. The selection is usually governed by local conditions.

Probably the greatest advance in street lighting accessories was the development of the Holophane prismatic refractor, which gives a control of light distribution hitherto unattainable. It can be used on either arc or incandescent lamps, its use being made possible by the fact that with the magnetite arc lamp the arc does not travel down as far as it does on the open and enclosed carbon arcs, and with Mazda lamps the filaments have been concentrated into a much smaller space than on the older incandescent lamps.

Utilitarian lighting is usually accomplished by means of pendant units mounted on bracket arms along one side of the street, while for ornamental lighting the units are mounted on the tops of poles and placed on both sides of the street, arranged either parallel or staggered. As the name implies, an ornamental system uses diffusing or other ornamental glassware, and the esthetic effect is obtained by some sacrifice in the efficiency of the unit. In a system of this kind, the upper stories of the buildings receive light from the unit and the





FLAT RADIAL WAVE REFLECTOR UNIT WITH THE LIGHT DISTRIBUTION FOR VARIOUS SIZED LAMPS

street receives back some of the upward light by reflection and diffusion from the building fronts.

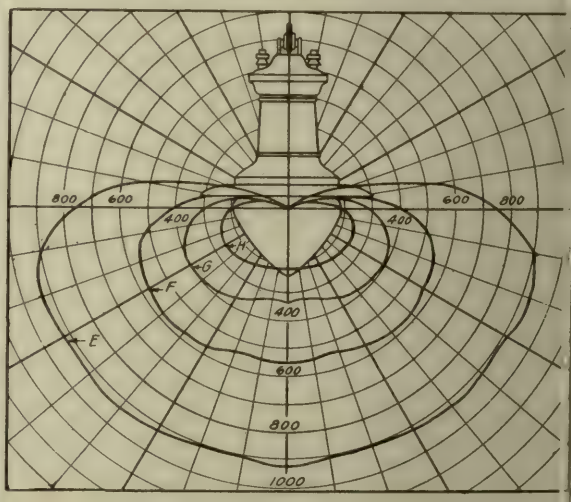
Obviously, intensities will vary with the class of service; i. e., outlying districts will not require as high an intensity as important residence streets, and the residential districts will not require the intensity of the business districts. In the various districts the important streets are usually given preference over the side streets as regards intensity of illumination.

The following table gives an indication of the illumination intensities required for various classes of service, but local conditions may necessitate a variation from these values, and a further development of the art may see them materially increased, a evidenced by some recent western installa tions:

	Average Horizontal Illuminati Foot-candles*
Principal streets in cities	0.25 to 1.00
Important side streets....	0.10 to 0.25
Residence streets	0.01 to 0.05
Suburban roads	0.005 to 0.01

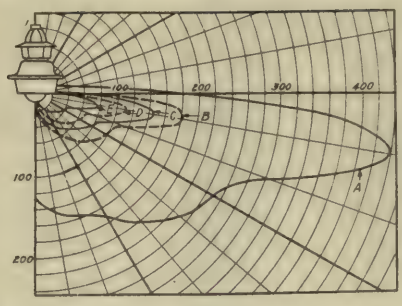
In using this table it should be borne mind that the color or reflecting power the pavements and buildings has a marke effect on the illumination of a stree Buildings or pavements having darl colored or dirty surfaces require a highe intensity of illumination than those havir light-colored surfaces, in order to appe equally well lighted.

*Illumination is expressed in *foot-candles*. A fo *candle* is the normal illumination produced by o unit of candle-power at a distance of one foot.



PENDANT UNIT WITH DIFFUSING GLASS GLOBE AND REFLECTOR

Note spherical distribution of light generally below the horizontal



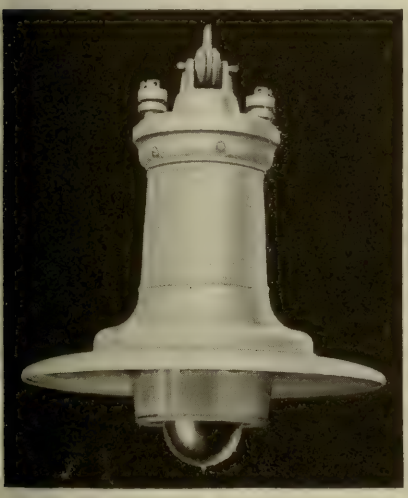
PRISMATIC REFRACTOR UNIT WITH LIGHT DISTRIBUTION CURVES

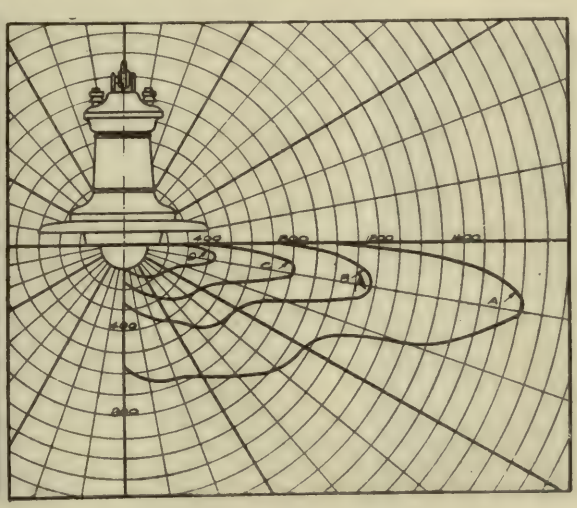
Clear glass globes are seldom seen to-day on large candle-power units, on account of the high intrinsic brilliancy of the light sources, but if clear glass globes are used, the units should be suspended as high as local conditions will permit. Diffusing glass globes or similar glassware will reduce the glare, and, tho lowering the efficiency of the unit as a whole, they may increase the ability to see.

Ornamental or "white-way" installations are becoming more and more popular as advertising features for cities. Business men realize the advantages of an ornamental lighting system in attracting crowds to their street and are usually willing to help financially in the installation. Civic improvement leagues and associations also realize the advantage to their city in such a system and usually support the movement.

Street Lighting with Series Lamps

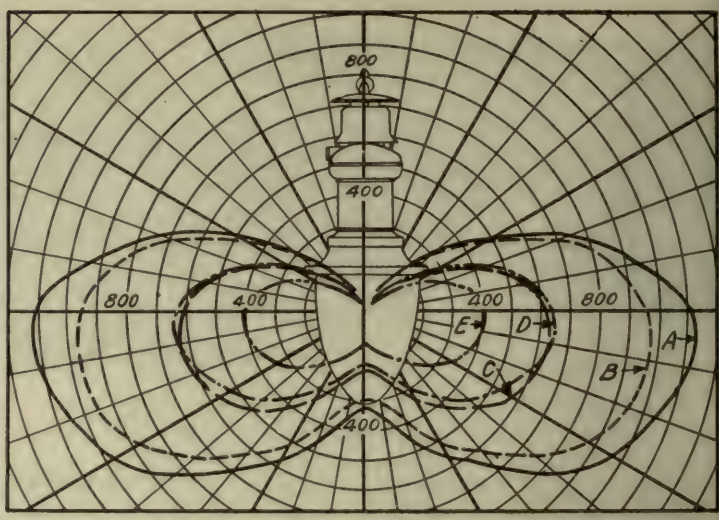
One of the most efficient methods of lighting streets to-day is the series incandescent lamp. It can be equipped with a variety of accessories suitable for all types of outdoor lighting, from the rural highway type to the so-called "white-way" or ornamental system in a business district. Various equipments of glassware and reflectors, together with a wide range of candle-power sizes, give a flexibility which adapts this lamp to almost every condition to be met in street lighting service. Never before has there been so large a number of units to select from, which will meet both small and large appropriations and give satisfactory results.





PENDANT UNIT WITH PRISMATIC REFRACTOR AND REFLECTOR

Light is here given a greater horizontal component



PENDANT TYPE LUMINOUS ARC LAMP WITH DIFFUSING GLASS GLOBE

Data on Incandescent Series Lamps

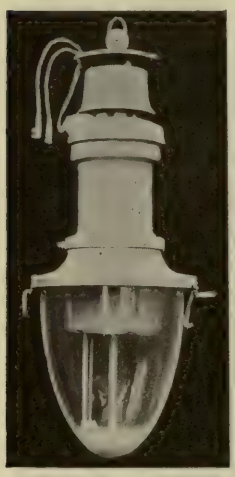
Nominal Rated Candle-Power	Total Lumens*	Watts 6.6 Amperes	7.5 Amperes
40	400	35	36
60	600	46.8	48
80	800	60	60
100	1000	72	72
250	2500	155	147
400	4000	244	228
600	6000	368	344

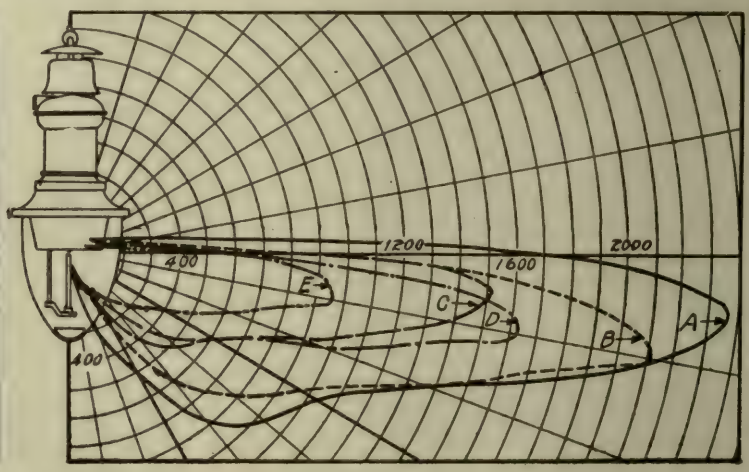
* The total flux of light from a source is equal to its mean spherical intensity multiplied by 4π (12.57). The unit of flux is called *lumen*. A *lumen* is the $\frac{1}{4\pi}$th (0.0796) part of the total flux of light emitted by a source having a mean spherical intensity of one candle-power.

For outlying and residence districts, especially where shade trees line the streets, small units, which can be hung low and spaced at frequent intervals, will give better results than large units spaced at relatively long intervals.

Street Lighting with Arc Lamps

The most efficient and useful arc lamp for street lighting to-day is the direct-current, series, luminous or magnetite arc lamp. It is economical to maintain and reliable in operation. It is made in two types, one for pendant lighting and one for ornamental or "white-way" lighting. It can be equipped with clear or diffusing glassware, or with a prismatic refractor. Long-life and high-efficiency electrodes are avail-





PENDANT TYPE LUMINOUS ARC LAMP WITH PRISMATIC BAND REFRACTOR

Showing the characteristic horizontal diffusion of the light

able which, when operated at various currents, give a wide range of candle-power to this unit.

Data on D. C. Series Luminous Arc Lamps

Pendant Type		Ornamental Type	
Amperes	Watts	Amperes	Watts
4	310	4	330
5	388	5	403
6.6	510	6.6	532

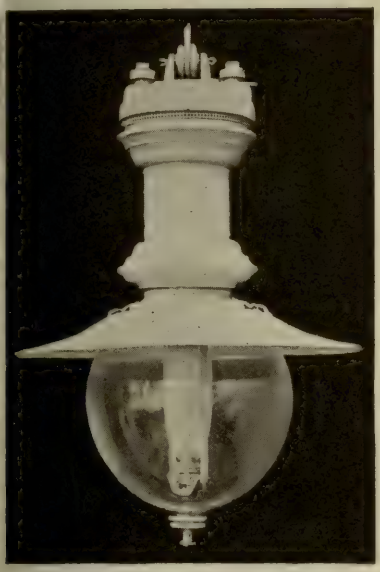
Street Lighting Contracts

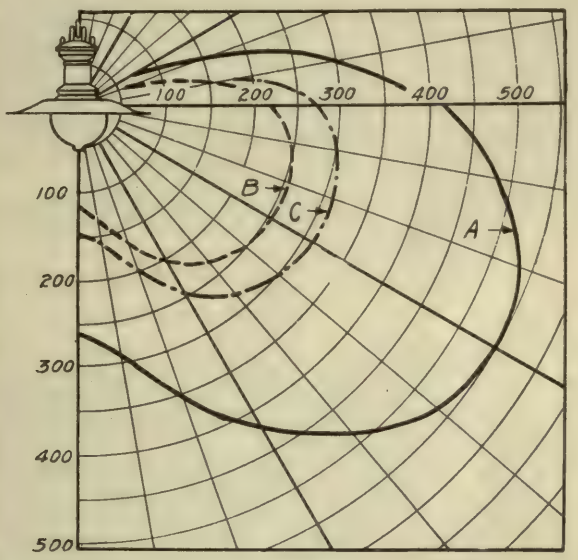
A great deal of trouble and misunderstanding between central station and city officials has been caused in the past, where the lighting plant is not municipally owned, by street lighting contracts not being specific enough. This matter has been receiving more and more attention by the national engineering societies and by various states.

Committees have endeavored to draft model contracts that would serve as guides, but the work is not so easy of accomplishment as it might seem, owing to the different conditions prevailing in various localities.

A great many factors that enter into this problem make it extremely difficult to draft a satisfactory street lighting contract. This condition results from the wide diversity of opinion as to what constitutes good street lighting and as to what is the best basis upon which different systems may be fairly and equitably compared. Some favor uniform over non-uniform lighting; some favor staggered over parallel arrangement of units; and some favor hanging the units over the center of the street instead of along the curb line. What are the relative advantages of each of these it is rather difficult to state on account of the lack of sufficient data and because what is best in one case may be entirely unsuitable in another, on account of a change in conditions.

Interior lighting practice is standardized to a great extent. There is a fairly close agreement as to the intensities required for various classes of interior lighting, but street lighting practice is not so well standardized, nor is it likely to be until the problems mentioned previously, and many others, have been solved. It is usually not a question of how much light should be given to this street or that, but on what will be the irreducible minimum, or of accommodating the street lighting system to an appropriation which is usually much too small.





ENCLOSED CARBON ARC LAMP WITH LIGHT OPAL GLASS INNER GLOBE, CLEAR GLASS OUTER GLOBE AND STREET REFLECTOR

It is quite generally agreed that the best method of comparing lamps or lighting units as regards their efficiency as light generators is on the basis of total lumens per watt (spherical candle-power x 4π). The total lumens will be a maximum when

the lamps have the least possible equipment; they will be greater with a clear globe than with a diffusing globe, and will gradually decrease as equipment is added. It can, therefore, be readily understood that it would be unfair to compare two units for efficiency, one having a clear globe and the other a diffusing globe. Obviously, the total lumens will vary with different densities of diffusing globes. Before writing contracts, therefore, it is advisable to know the energy consumed and the characteristic candle-power distribution of the equipment it is proposed to use. These can best be obtained in a properly equipped laboratory. The contract should specify the lamp equipment, operating conditions, etc., and if the specifications are complied with, the city will get its full measure of illumination. It is a comparatively simple matter to check up the energy consumed, but the making of satisfactory candle-power or illumination tests in the street is both difficult and expensive, especially during the winter months,—and that is when the lights are most used. There are some variations in individual lamps and equipment from the ideal aimed at in manufacture, and the contract should not be too rigid and should not impose unnecessary restrictions on the central station, or the increased cost of service will be more than the supposed advantages are worth.

Advances in the art may make a change desirable, and some means of doing this should be provided for on a fair and equitable basis to both parties. It would seem as if the best service and lowest rates can be obtained only by a close coöperation between all the parties concerned before the contract is written and signed.

Editorial Note.—The material for this article, including the illustrations, is used by courtesy of the *General Electric Review*.

Sootless Saturdays

By W. A. Mohrbacher
Chief of Fire Department, Cedar Rapids, Iowa

COALLESS Mondays, meatless Tuesdays, wheatless Wednesdays, porkless Saturdays—how about sootless Saturdays?

Our citizens are loyal in their efforts to conserve fuel, meat and wheat, and to economize along almost every line, but they seem to forget about "conserving" by preventing the total consumption—the entire wiping out— of their homes by fire, to say nothing about conserving on expenses incident to the calling of the fire department.

Every time the fire department answers an alarm there is an expenditure of the taxpayers' funds in the wear and tear on the apparatus, in the use of gasoline for motor apparatus and in the upkeep of the teams in use by the department. Then there is also the ever-present possibility of accidents and their dire results. During the month of December the fire department of Cedar Rapids answered 71 fire alarms, and of that number 31 could be traced to soot that had accumulated in flues since the weather became cold enough for furnace fires. Most of these alarms came from neighborhoods where modern furnace-heated homes predominate.

Students of fire prevention account for these alarms as being due to the desire for quick, hot fire in furnace-heated homes. Soft coal is used, the drafts are all opened, and red-hot soot is carried out by the draft onto a wooden shingle roof. The result is a fire alarm and the attendant expenditure of the taxpayers' money. Of course, the fire department is commissioned to answer fire alarms and not to worry about how taxes are spent, but the living conditions of every one of us are affected by such waste and loss as this, and there is always the danger that some time the department may be out at a chimney fire and a real fire will start which might be controlled if the department could get the water onto it without delay.

Many patent soot removers are on the market, chimney sweeps are available, and the people can burn scraps of zinc in the furnace, which will help remove the soot without blowing it out as a chunk of red-hot coal upon the roof.

Saturday is suitable for a set-to against soot, so let housekeepers devote the day to this phase of conservation.

Fighting Fire in an Army Camp

PHILLIPS UNIVERSITY LIBRARY

THE NEWLY ORGANIZED SOLDIER FIRE DEPARTMENT AT CAMP GORDON, NEAR ATLANTA, EXTINGUISHING A DANGEROUS FIRE NEAR THE CAMP ENTRANCE.

Photographs by courtesy of the American-La France Fire Engine Company, Inc.

GENERAL SWIFT, COMMANDING CAMP GORDON, WATCHING THE FIREMEN AT WORK

City Manager Plan, With Proportional Representation, for Kalamazoo

By Harry H. Freeman
Secretary, Kalamazoo Chamber of Commerce

BY a vote better than three to one, the electors of Kalamazoo, Mich., adopted a new city charter at a special election, Monday, February 4.

The movement for a new charter began in the summer of 1916, under the charge of a committee from the Kalamazoo Chamber of Commerce, and was significant because of the careful and thoro preparation for each successive step. For six months prior to asking permission from the electors to prepare a new charter, an educational campaign was carried on which crystallized sentiment in favor of the city manager plan with proportional representation. The advantage of this preliminary effort was apparent immediately upon the election of a Charter Commission on April 2, 1917. The voters, thru the building of the New Charter League of some seventeen hundred members during the preceding six months, had expressed the desire for a new charter embodying the election of a city commission by proportional representation and the administration of municipal affairs by a city manager.

In brief, the new charter provides for the election from the city at large of seven city commissioners for two-year terms by the Hare system of proportional representation. The City Commission is empowered to engage a competent man as city manager, who is charged with full power and responsibility for the administrative side of the government. Care was taken not to restrict the manager in any sense, but rather to give him broad powers. The administrative service is divided into six departments, as follows: Law, Finance, Public Safety, Public Works, Public Utilities, Public Health and Welfare.

The charter provides for the initiative, referendum and recall, stringent provisions on public utility franchises with the reserved right of the city to purchase or condemn them at any time, centralized purchasing, mandatory compilation and publication in pamphlet form every two years of all city ordinances, and many features of particular local interest and value.

Aside from the novel system of electing candidates—Kalamazoo is now the largest city in the country using proportional representation—the manner in which the Charter Commission treated civil service is especially noteworthy. The Charter Commission endorsed the civil service principle for determining the qualifications and merit of respective candidates for city offices, but so drafted the charter provisions as to "leave the back door open." To quote:

"The City Manager, or other official or board in whom is vested disciplinary or removal power, shall be allowed full freedom in his or its action on such matters; it being the intent and spirit of this section to provide a fair and honest approach to municipal employment for every inhabitant of the city, but in no sense to handicap or curtail the responsible administrative officers in securing efficient service."

The new Kalamazoo charter and the campaign carry a lesson for all communities seeking charter reform. First, that it pays to make sure of every successive step by careful and, if need be, prolonged effort. A year or more is none too long to do such a job in an efficient way. Second, that every bit of time, effort and money spent in creating favorable sentiment counts decidedly in permitting the Charter Commission to submit new and desirable features without fear of endangering the charter itself. To illustrate: The Ashtabula Charter Commission was unwilling to submit its charter having proportional representation in it, for fear the new feature would defeat the whole proposition. Consequently, their charter came first and proportional representation was added at a later date. The Kalamazoo Charter Commission, by reason of having had the stage carefully set for it, dared to make proportional representation a vital feature of the charter itself, as well as to handle civil service in a manner distinctly different—and infinitely better—than it has yet been treated in any charter.

Items of Municipal Law

By A. L. H. Street

Enforceable Garbage Regulation

An ordinance of the city of Omaha defining garbage as including "refuse, accumulation of animal, fruit, or vegetable matter that attends the preparation, use, cooking or the dealing in or storage of meats, fish, fowl, fruits or vegetables," and prohibiting its removal thru the streets or alleys by anyone not employed by the city for that purpose, is valid and not an invasion of the constitutional rights of restaurant keepers and other persons who might otherwise dispose of their garbage at a profit. (Nebraska Supreme Court, Urbach vs. City of Omaha, 163 Northeastern Reporter, 307.)

✣ ✣

Revenue Measures and Interstate Commerce

An ordinance of the city of Pueblo imposing a fee of $25 for a permit to distribute circulars and advertising matter within the city limits must be regarded as a revenue measure, and not supportable as a reasonable police regulation. It is unenforceable against a traveling salesman engaged in taking orders from local dealers for goods to be shipped in interstate commerce, and distributing circulars to stimulate business for such dealers, as part of the consideration for receiving such orders. (Colorado Supreme Court, City of Pueblo vs. Lukins, 164 Pacific Reporter, 1164.)

✣ ✣

Municipal Liability Concerning Streets

Municipalities are not insurers of the safety of their streets, but are obliged to keep them in reasonably safe condition, for persons traveling in the usual way and exercising due care, and no part of the street should be neglected. While size of municipality and amount of traffic may be considered in determining municipality's negligence in maintaining defective streets, these circumstances will not relieve it from liability for injuries resulting from its negligence. (Mississippi Supreme Court, Higginbottom vs. Village of Burnsville, 74 Southern Reporter, 133.)

Municipal Fire Regulations

The fact that an ordinance fixing a city's fire limits prescribes a penalty for violation of the regulation does not provide an exclusive remedy against construction of nonconforming buildings within such limits. The city is entitled to maintain suit to secure removal of the building. Where an ordinance embodying general fire prevention measures has been adopted, the city council cannot give valid permission to a particular person to violate those regulations. (Kentucky Court of Appeals, Galanty & Alper vs. City of Maysville, 196 Southwestern Reporter, 169.)

✣ ✣

Liability for Slippery Streets

A city is liable for injury to a pedestrian caused by skidding of an automobile against him on a street which the city had negligently permitted to become and remain slippery thru sprinkling it with oil, assuming that the cause of the accident is directly traceable to the condition of the street and not to incautious driving of the automobile. (Massachusetts Supreme Judicial Court, Kelleher vs. City of Newburyport, 116 Northeastern Reporter, 806.)

✣ ✣

Valid Quarantine Regulation

A New York city of the second class may validly provide by ordinance that there shall be no communication with any house or family infected with certain contagious diseases, excepting by physicians, nurses, etc., and empower the city health department to use reasonable discretion in ordering absolute quarantine. (New York Court of Appeals, Crayton vs. Larabee, 116 Northeastern Reporter, 355.)

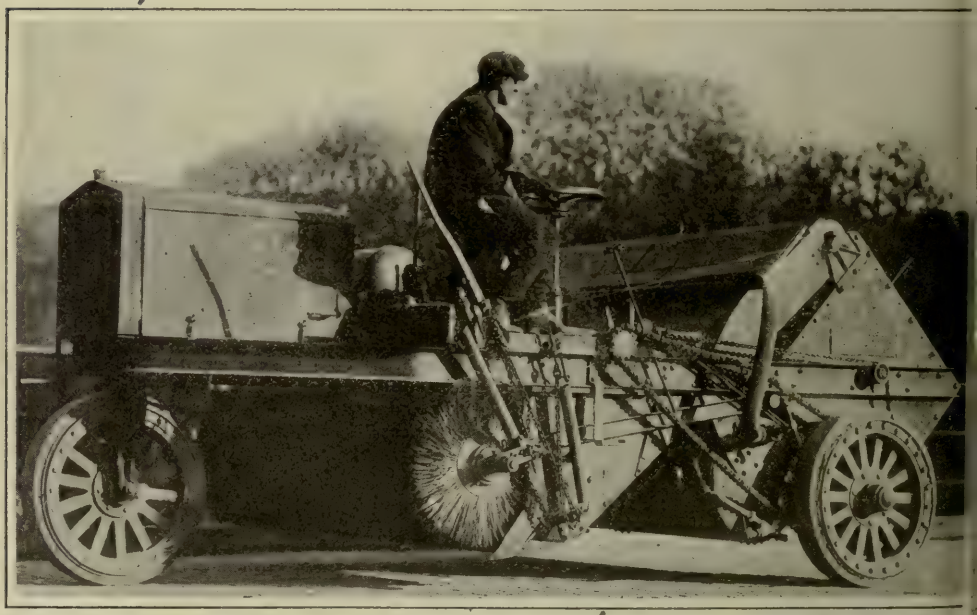
✣ ✣

Regulations Concerning Weapons

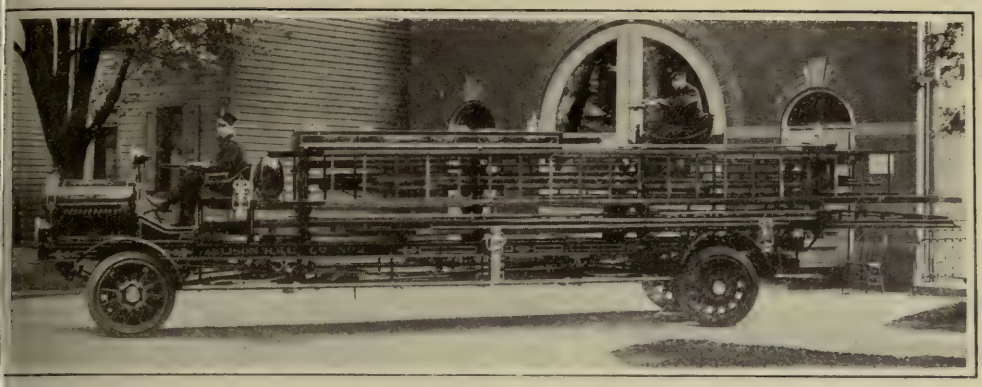
One of the most important police powers of a city being to protect the public safety, an ordinance regulating the carrying and disposition of weapons is valid. Display and advertisement of revolvers for sale may be prohibited. (Illinois Supreme Court, Biffer vs. City of Chicago, 116 Northeastern Reporter, 182.)

Motor Trucks Are Rendering Both Municipal and National Service

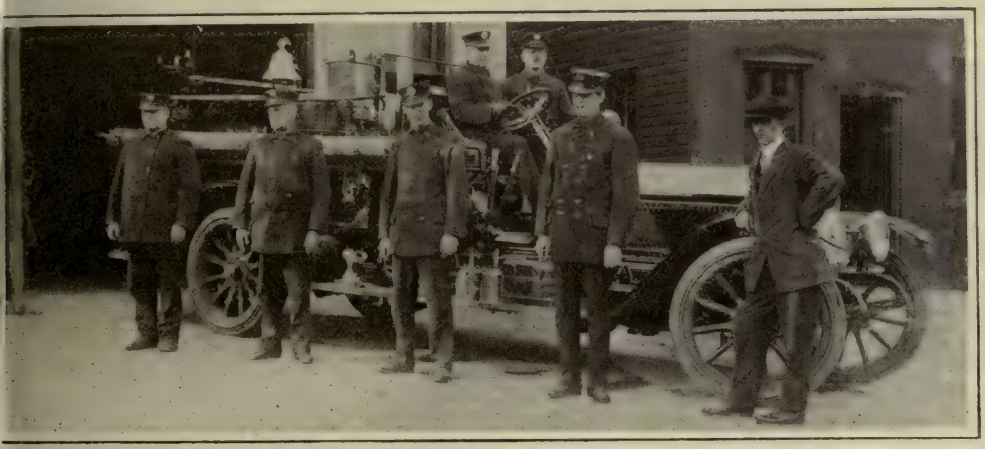
TRAIN OF WHITE TRUCKS IN SERVICE OF MEDICAL OFFICERS' TRAINING CAMP AT FORT RILEY



ELGIN STREET SWEEPER IN SERVICE AT EASTON, PA., WHICH SPRINKLES, SWEEPS AND COLLECTS AT ONE OPERATION



DUPLEX FIRE TRUCK IN USE AT HARRISBURG, PA.



AMERICAN-LA FRANCE PUMPING CHEMICAL AND HOSE CAR, WITH UNITED STATES TIRES, OSWEGO, N. Y.

FLEET OF GRAMM-BERNSTEIN TRUCKS COMPOSING THE FIRE DEPARTMENT OF LIMA, OHIO

Modern Lighting Method

THE OLD WAY

Two sets of poles.

Tubular steel for supporting trolley wires.

Cast iron standards for lighting.

DOUBLE EXPENSE

Unnecessary obstruction along the curb line.

Underground wiring absolutely necessary.

Difficulty of keeping both sets of poles in alignment.

THE ELRECO WAY

One set of Elreco combination p

The addition of ornamental bra and base transforms the ordinary p trolley pole into a handsome ligh standard.

"White Way" is obtained at less t one-half the cost of a separate inst tion.

Lighting wires may be attache top of poles—saving all exper underground construction.

Curb line free from all unneces obstruction.

Get full details and catalog

Electric Railway Equipment Co

Manufacturers **Cincinnati, Ohi**

NEW YORK OFFICE **30 CHURCH STREET**

FILTRATION PLANT, GRAND RAPIDS, MICH.

The Characteristics of a Lime Softening Filtration Plant

By Walter A. Sperry
Chief Chemist, Filtration Plant, Grand Rapids, Mich.

THERE are probably few people not intimately connected with filter plants who realize the difference between a filter plant proper and one where water softening with lime is also accomplished.

While the effluents from these two types of plant may differ materially, both should be clear and bacteriologically satisfactory. The softening plant is more likely to have a more nearly colorless effluent. The effluent of the filter plant has a total hardness little changed from that of the water constituting its source, while the corrosive properties are increased by the release of carbon dioxide in proportion to the amount of alum being used. The effluent of the lime softening plant is always alkaline in its reaction and softer than the original water, and all of the corrosive properties due to carbon dioxide are removed.

The problem of control in a lime softening plant is one requiring constant vigilance. Unlike many alum plants, it demands hourly chemical control, for, on the one hand, the operator of the alum plant uses readily soluble chemicals of constant composition, while, on the other hand, the operator of the lime softening plant deals with a chemical of quite variable composition, incapable of complete solution in the quantities in which it must be used. All this demands apparatus quite foreign to the ordinary filter plant, such as slaking boxes, storage tanks equipped with stirring apparatus and a complete set of flushing and draining pipes to remove the refuse of the chemicals.

The equipment of most importance in a lime softening plant, aside from the pumps, filters and clear well, is the mixing chambers, settling basins, chemical dosing devices and the means for storing and preparing the lime.

The Mixing Chamber

The first requisite of a mixing chamber, as of settling basins, is ample capacity. With the temperature of the raw water ranging from 75° to 80° in summer to 32° in winter, it has been the experience of the Grand Rapids plant that the softening reactions which are complete in one-fifth of the mixing chamber in summer are scarcely completed in the whole chamber in winter. Hence, it can be seen that a mixing chamber must be built with reference to an ample time element to allow for the completion of reactions in winter as well as under more favorable temperature conditions, and must also be baffled to insure thoro agitation.

A recent study of the Grand Rapids mixing chamber, which is approximately 200 feet long and has a flowing-thru period of about one hour and ten minutes, was made when the rate of operation was 16,000,000

THE HEALTH OF YOUR CITY

MUST BE SAFEGUARDED

You are not prepared for the Spring clean-up unless your equipment includes

THE OTTERSON AUTO-EDUCTOR

TO CLEAN YOUR CATCH BASINS

THE OTTERSON AUTO-EDUCTOR CO.

817 Fairbanks Bldg., Springfield, Ohio

U. S. gallons per day. This study showed that in summer the reaction of the chemicals is practically complete at the end of twenty-three minutes, while in winter the chemicals have scarcely begun to act in this time and the reaction is barely complete when the water leaves the mixing chamber. Studies to determine the best point to apply the alum have shown this should be done as near the discharge end of the mixing chamber as will allow a thoro mixing of the coagulant with the precipitated lime particles before discharge into the settling basins.

The Settling Basins

The essential features of the settling basins are correct baffling, proper placing of inlet and outlet gates, sufficient size of flushing drains, adequate means of handling sludge deposits, and as large an area for settling as money and conditions will permit. While no settling basin, however well designed, can make up for improper treatment of the water, still a well-designed basin can produce more satisfactory effluents under a wider range of conditions of treatment and also will produce a more matured or better "cured" water—that is, one which is less likely to change in character either in passing thru the filters or in the distribution mains.

The reactions begun in the mixing chambers are not complete even at the point where the water is discharged from the settling basins in the Grand Rapids plant. The water undergoes still further changes in passing thru the filters, and to a lesser extent in the distribution system. The experience of this plant indicates that the lime treatment supplemented by alum must be so controlled that the magnesium content of the water may be kept as low as possible in order that there may be lessened incrustation of the filter sands, increased length of filter runs, decreased percentage of wash water used and decreased periods between scrapings of the sand.

The Progressive Effect of the Treatment

The following table shows the amount of "curing" taking place progressively thruout the plant. The figures are the average values for the whole of 1916:

	Alkalinity	Magnesium
River water	194	18.5
Effluent from softening tank	65	...
Effluent from settling basins	58	10.0
Effluent from filters	47	...
Water from city mains	47	10.3

The reduction in alkalinity from 58 to 47 parts per million is responsible for the rapid increase in the size of the sand grains in the filter, shown in the following tabulation of its physical and chemical characteristics in 1912 and 1916:

Sand as placed, Nov., 1912:
- Soluble in acid, 6.4 per cent.
- Uniformity coefficient, 1.63.
- Effective size, 0.27 mm.
- Thickness of sand coating, 1914, 0.04 mm.
- Increase in volume, 1914, 52.5 per cent.
- Specific gravity, 2.651.
- Composition of coating:
  - Calcium carbonate, 80 to 85 per cent.
  - Magnesium carbonate and hydrate, 15 to 20 per cent.

Sand as removed, August, 1916:
- Soluble in acid, 68 per cent.
- Uniformity coefficient, 1.
- Effective size, 0.58 to 0.66 mm.
- Thickness of sand coating, 0.115 mm.
- Increase in volume, 72 per cent.
- Specific gravity, 2.42.

This large variation in properties shows that the actual condition of the sand used in the filters of a lime softening plant is not of primary importance, but should, however, be given due consideration in order not to invite undue trouble. The variation in the size of the sand grains would probably have been less had the same efficient control been maintained over the magnesium content of the filtered water in the past, as was the case last year. The effectiveness of the treatment is well shown in the following table:

	1913	1914	1915	1916
Magnesium in filtered water, parts per million	14.1	13.2	13.6	10.4
Per cent magnesium removed from raw water	25.0	33.6	37.6	43.7
Average alum used, grains per Imp. gallon	1.01	0.69	0.91	1.23
Average alum used, grains per U. S. gallon	0.84	0.50	0.76	1.03

The Elimination of Troubles

During 1913 much trouble was experienced with hot water heating devices which burned out or had to be frequently removed or cleaned. An investigation carried on at the water-works laboratory showed conclusively that if the magnesium removal was kept at 25 per cent or better, such troubles would be greatly reduced. A second important trouble noted was the sticking of water meters, part of which was due to the types purchased before the introduction of softened water. The zinc lining and the softened water reacted to form a coating which prevented the free action of the meter. After this trouble was located, ungalvanized meters were installed, with the result that there has been less trouble. There is still some trouble experienced from ungalvanized meters, but it

Tarvia

Preserves Roads
Prevents Dust—

Top—Lincoln Highway east of Greensburg, Pa., treated with "Tarvia-B."
In Circle—Boston Post-Road—a Connecticut section—treated with "Tarvia-B."
Bottom—Harrisburg Pike near Columbus, O., built with "Tarvia-X," 1915.

PUBLIC ROADS

Whereas, It is essential that all the transportation facilities of the Nation should be brought to the highest state of efficiency in order that food-stuffs may be moved most economically from the farm to the market, that manufactured products be moved at the lowest cost from the factory to the consumer; and,

Whereas, The public highways offer a good, prompt, and economical means to supplement transportation by rail and water; therefore,

Be It Resolved, That the prompt improvement of our public highways is important and should be forwarded in every proper way.

—*Resolution adopted at War Convention of the Chamber of Commerce of the United States.*

Good Roads to the Rescue of the Nation!

Our industrial and military mobilization has overwhelmed the railroads.

Embargoes, a desperate expedient to relieve the glut, are incessant embarrassments to shippers.

Even the Government cannot get its freight through. In some railroad yards the wrecking-derricks are used to get particular cars out of the jam by lifting them bodily from the side-tracks to the main-line. Switch-yards get so full that the main-lines are blocked by waiting trains.

But in those sections where long level routes of good roads connect the cities, motor-trucks are accomplishing marvels of long-distance transportation.

More and more New England is delivering to New York that way, and the Boston Post-Road hums with the endless procession of heavy trucks.

Detroit is sending great caravans all the way to the seaboard, and that is a feat because all the roads are not good.

And one impassable mile in the journey is enough to clog the whole line. Keep the roads good! Make them fit for the new traffic! That should be the watchword! Construct and treat your roads with Tarvia. It will make them not only automobile-proof, but motor-truck-proof.

Its use will exclude frost and rain and make an *all-the-year-round* road. It saves labor in replacements and repairs.

The use of Tarvia will insure *good roads at the lowest possible cost.*

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria
THE BARRETT CO., Limited: Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney,

TRADE B MAR

THE FILTER GALLERY OF THE GRAND RAPIDS FILTRATION PLANT

has been impossible to find the exact cause; it is thought that, as with the hot water heating systems, much of the difficulty could be done away with by more intelligent installation. Examination of the field evidence shows that larger pipes and fewer elbows with less places for deposits to collect would eliminate a large proportion of the trouble. In the case of meters, it has been suggested that settings be made so that the meter will be subject to as little fluctuation in temperature as possible. All these suggestions are given only with the hope that they may retard trouble until investigation can be made. It is important to note that all these troubles have been gradually reduced as the magnesium has been more nearly removed.

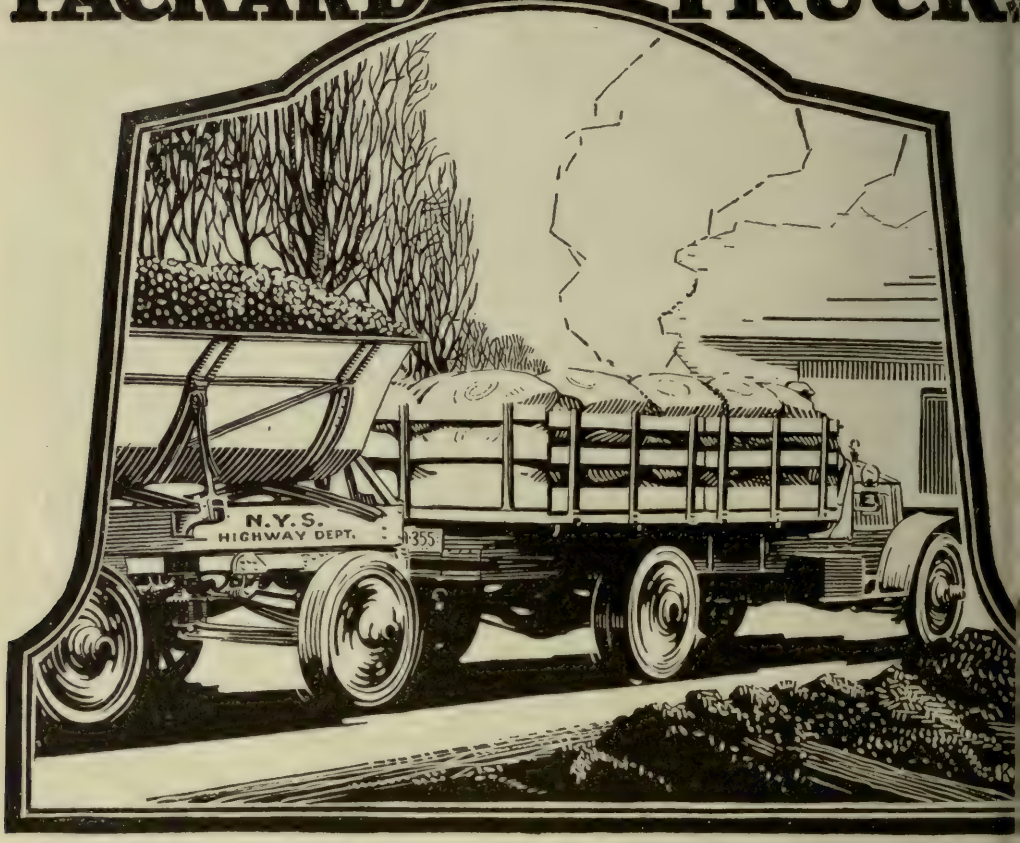
In the light of the experience of the Grand Rapids plant for the last four years, it seems that for moderately hard waters carrying moderate amounts of magnesium the objective of plant control should be to reduce the magnesium content as much as possible thru efficient control and constant attention to the lime used in softening.

Editorial Note.—The foregoing article is a review by the author of his original paper read before the thirty-eighth annual meeting of the Michigan Engineering Society, at Saginaw, Mich.

Phases of Garbage Disposal

The general police power of a municipality to provide for the public health of the community sustains the validity of an ordinance regulating the cleaning of cesspools, removal of garbage, etc., and requiring such work to be done exclusively by a sanitary contractor engaged by the city for the purpose. But municipal control in such matters is a governmental function, within the rule of the law that a municipality is not liable for injuries accidentally inflicted in the performance of such functions. Hence, negligence of an employe of a sanitary contractor in failing to properly replace a cesspool cover cannot be imputed to the city, so as to make it liable in damages for injury sustained by plaintiff in consequence of such negligence. (Mississippi Supreme Court, Shepperd vs. City of Gulfport, 77 Southern Reporter, 193.)

PACKARD TRUCKS



Hauling economy! In building stat roads Packard trucks serve and save

Highway transportation has suddenly assumed vital importance in American business and American war preparations.

To relieve the overburdened railroads and move the vast bulk of wartime freight, federal, state and county governments are co-operating with business men in developing a new and more efficient road hauling.

Where good roads lead, the best motor-trucks can move all but heavy, low-cost materials and products fa and cheaper than the railroads can

In providing such roads, New Y State has pioneered the way. An building them, the New York Co mission of Highways has recogni the economy and dependability Packard trucks.

Silent, chainless units in seven *ri* sizes—all with four-speed transm sion. Write Packard Motor Car C Detroit. *Ask the man who owns*

Packard

News and Ideas for Commercial and Civic Organizations

The Replanning of Sherman

SHERMAN, TEX.—The directors of the herman Chamber of Commerce and the ity officials have gotten behind a movement o replan Sherman along modern lines. An nalysis of the conditions indicates that ltho the manufacturing establishments re producing rapidly, the population has ot grown proportionately. This is due to ertain physical defects which are not or-anic, and are therefore not irremedial. or instance, the valley of an originally eautiful stream running west of the busi-ess section is filled with negro shacks and ubbish. There are hills beyond the valley f this stream which would furnish excel-ent building sites for handsome residences nd would provide ample room for the ex-ansion of the city. Located between a ine residence section and the business cen-er of the town are a number of railroad racks on which hundreds of cars are switched daily. The presence of the tracks n this section has lowered property values nd greatly hampered the city's growth.

It is apparent that these defects must be corrected if the city is to grow, and the city administration, which is a progressive one, is wide-awake to the need of replanning the city. For that purpose it has engaged the services of George E. Kessler, of St. Louis, who is gathering data preparatory to making recommendations for improvements. The citizens themselves are keenly interested in the subject, as was shown at a conference between the City Plan Committee of the Sherman Chamber of Commerce and Mr. Kessler. Prominent men and women from all parts of the city were present and offered valuable suggestions. With this appreciation of the situation on the part of the public, it is believed that the plans which Mr. Kessler will finally present will receive the support necessary for their immediate adoption.

At the conference referred to, the following outline of the problems for which solutions are sought was drawn up:

1. *Parks.*—(*a*) Complete the plans for the park system and plan parks to serve each section of the city. (*b*) Playgrounds, wading and swimming pools. (*c*) Boulevards to connect the parks. (*d*) Red River Valley Fair.

2. *Streets and Alleys.*—(*a*) Eliminate grade crossings, especially those cutting off East Sherman, and, if practical, those cutting off North Sherman. (*b*) Changes in street plan, such as openings, widenings, straightenings and closings. (*c*) Street lines for future additions. (*d*) Classifications of streets as to use—heavy traffic, pleasure and residence. (*e*) Character and width of pavement, walks, etc., for different types of streets. (*f*) Street lighting—extensions and economies. (*g*) Street cleaning. (*h*) Use of streets by public service corporations. (*i*) Street beautification, as related to the use of trees and grass, billboards, poles, wires and fixtures. (*j*) Storm sewers. (*k*) Opening, widening and changing of alleys.

3. *Sanitation.*—(*a*) Garbage disposal. (*b*) Streams of the city. (*c*) Sewer extension.

4. *Retail Trade Development.*—(*a*) Municipal market. (*b*) Auto parking.

5. *Factory Development.*—(*a*) Suggestions as to a terminal factory building. (*b*) Industrial sites. (*c*) Other conditions that will attract factories and wholesale houses.

6. *Transportation.*—(*a*) Street car service and extensions. (*b*) Interurban. (*c*) Passenger service. (*d*) Freight service.

7. *Housing.*—(*a*) Building and sanitary regulations. (*b*) Protection of residence sections from intrusions by business houses. (*c*) Provision of a desirable section for negroes. (*d*) Regulation of building heights. (*e*) Fire limits.

8. *Public Buildings.*—(*a*) Future public school buildings. (*b*) County buildings—

GMC TRUCKS

GMC Trucks provide pulley power

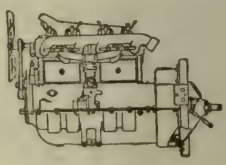
An interesting example of the versatility of the GMC Truck is the service it performs by means of the "take-off" winch attachment.

One of the practical uses of this feature is shown in the pole raising scene in the above picture which is reproduced from a photograph. The GMC Truck is being used for line construction at Camp Gordon near Augusta, Ga. Five other GMC Trucks have been purchased by the Southern Bell Telephone Company on the showing made

The winch device can be attached to any GMC Truck, and it is very simply operated.

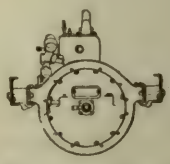
In loading heavy machinery on a truck and for many other uses, the winch will do the work of several men. It is a labor saver, a time saver, and a money saver.

Order your next GMC Truck with a winch attachment or add this inexpensive feature to your present equipment. You will find it a profitable investment.



Power Plant

The source of power the heart of the mechanism—a GMC engine is built for greater strength and endurance than will ever be called for during its life.



GMC engines are simple in construction and dependable in service. Three point suspension guarantees against strain. Adjustable parts are easily reached.

Write to *Truck Headquarters.*

GENERAL MOTORS TRUCK COMPANY

One of the Units of the General Motors Corporation

New York Boston Philadelphia PONTIAC, MICH. Chicago St. Louis San Francisco (315)

urt house, jail. (*c*) Municipal buildings auditorium, city hall, fire stations, etc. (*d*) Railway stations and interurban station. (*e*) Other public or semi-public uildings. (*f*) Suggestions for treatment grounds.

9. *Miscellaneous.*—(*a*) Aeroplane landg station.

The realization that keen competition ill exist between the cities of this country the close of the war is an additional inentive for making the best possible use of e city's natural advantages. When the nprovements have been made, there is litte doubt that the city will be able to hold s own with competing cities.

J. E. SURRATT,
Secretary, Sherman Chamber of Commerce, also Secretary, Texas Town and City Planning Association.

Charleston County Votes Bonds for Road Work

CHARLESTON, S. C.—The Charleston hamber of Commerce recently held an lection in which bonds in the amount of 275,000 were voted for the construction of ermanent highways in Charleston County. he election was a regular plebiscite, paricipated in by all the people of Charleston ounty, but to the Chamber of Commerce re due the idea of creating the bond issue nd the success of the election. It is cerain that Charleston County would not have ad $275,000 to spend for good roads except or the efforts of the Chamber of Comnerce.

Much of the road improvement work in harleston and adjoining counties in recent ears has been done thru the untiring efforts f the Highways and Bridges Committee of he Charleston Chamber. The men of this ommittee felt, however, that all that had one before was as nothing compared with hat remained to be done, and that it was opeless to continue their propaganda uness they could make a real start with a subtantial sum of money. Charleston County was bonded almost to its limit. Therefore, he road workers got together and determined to ask the Legislature to authorize a bond issue of $275,000, which was found to be all that remained available to the county. The matter was successfully handled in the Legislature and authority for the election was given.

The next step was to hold the election. It was complained that a special election would cost the county a great deal of money. To meet this objection, the Chamber of Commerce induced about one hundred and fifty of its members to serve as election managers and clerks without cost. Further, the Chamber obtained free polling places in all parts of the city and county.

The date for the election having been set, and the managers and polling places having been obtained without cost to the county, the Chamber of Commerce set to work to carry the election. A campaign organization was formed as carefully and thoroly as tho some political party were running a man for office. Then every day during the two weeks before the election there appeared in each of the three daily papers of Charleston an article supporting the bond issue. These articles were prepared by the publicity department of the Chamber. Finally, for ten days before the election, a half-page of paid advertising space was used each morning.

When all this work began, there was great indifference to the road bond election thruout the community. That the Chamber of Commerce was able by means of its publicity and its work at the polls to overcome this is evidenced by the fact that the bond issue was passed by a vote of about seven to one.

SIDNEY RITTENBERG,
Publicity Secretary, Charleston Chamber of Commerce.

Manufacturers' Coöperative Auto Freight Service

MERIDEN, CONN.—Freight congestion on the railroads in central Connecticut had become such a menace to the manufacturers of articles light in weight and small in dimension that a few manufacturers began using auto trucks for transporting their goods, until a regular package freight service grew up between towns like Meriden, Hartford, Bridgeport, etc. These trucks, of course, would return home empty. To avoid the waste of time and gasoline incident to transporting articles only one way, it occurred to the Meriden Chamber of Commerce that a real public service could be rendered the community if an arrangement were made with the manufacturers whereby available cargo space in their trucks could be used both ways by other shippers. This arrangement was made, and

Another FEDERAL

The St. Louis Water Division's 3½-ton Federal quickly and economically moves sewer construction and repair supplies.

Federal Proves Worth
Sewer Construction Wo

The Water Division of St. Louis makes widest use of its 3½-ton Federal truck in m taining its water and sewerage systems u the mark.

Federal adaptibility to every hauling requ ment and low cost of operation fit Federal tr particularly for municipal service.

Let us show you how Federals are promo municipal hauling efficiency.

Write for Federal Traffic News

A Capacity for Every Requirement

FEDERAL MOTOR TRUCK (
343 Federal Street, Detroit, Michiga

FEDERAL

e Meriden Chamber constituted itself a rt of clearing-house to which the shipper f small packages reports the amount and estination of the consignment, and the uck drivers report their available cargo pace. The work is all done over the telehone.

Over the wire will come the question, Chamber of Commerce?" The girl relies "Yes," and over the wire again will ome the words, "Truck for Hartford," peraps. The young lady at the telephone runs ver the tabulation of packages ready for hipment to Hartford and gives the truckriver the names of the consignors and the mount of space required for the packages. he driver tells her whether he will or will ot call for the packages. If he agrees to et them, the memoranda are checked and he young lady calls up the shippers and ives them the name of the truck that will all for them. Hundreds of tons of exremely valuable freight are moved each veek in this way. The manufactured prodicts of Meriden include such articles as ilverware, clocks, bench-tools, etc., and heir weight and bulk are small compared o the money value. The present method f shipping such articles is not only more xpeditious, but safer.

HAZLETT N. CLARK,
Secretary, Meriden Chamber of Commerce.

Free Transportation brings Trade

TITUSVILLE, PA.—The Titusville Chamber of Commerce recently inaugurated an effective method of widening its trade territory and of bringing the people of the adjacent country into the city to shop. An arrangement was made with the Traction Company to grant to the country people served by the road the free service of four of its cars coming into the city during the forenoon and of four cars leaving the city during the afternoon of each day except Sunday. The cars are run on schedule time. Thru the Chamber of Commerce, the merchants pay a stipulated sum per day for this free service. Those who are contributing toward it display a card in their windows stating the fact. The individual merchants do no other advertising of the plan except to insert a line in their newspaper advertisements inviting people to use the free transportation service. The merchants have attempted to impress upon the people the fact that riding on the free cars does not obligate them in any way, and that they are not compelled by so doing to make purchases in the city, but may use the cars for whatever purpose they desire. They are urged to bring their produce to town on the cars, and if they make purchases, to send the packages home on the afternoon cars without expense to themselves.

The newspapers carried a full-page advertisement of the free transportation service, which read as follows:

ANNOUNCEMENT!
FREE TRANSPORTATION SERVICE
TO THE PEOPLE OF EASTERN CRAWFORD AND WESTERN VENANGO COUNTIES
STARTS MONDAY MORNING, NOV. 5TH

The Business Men of Titusville whose names appear below have completed arrangements with the Titusville Traction Company to provide *free transportation*, as is shown in the schedule below, for passengers, produce and merchandise into and out of Titusville, and they join in extending to you an invitation to visit Titusville for any purpose you may desire.

[The time schedule of the free cars running between Titusville and several nearby towns daily is given at this point.]

All Persons are Cordially Invited to Visit Our City. No Obligation to Purchase Required of Our Visitors.

THIS SERVICE IS ABSOLUTELY FREE
WITH THE COMPLIMENTS OF

[Here follow the names of the Titusville merchants, classified according to their business.]

At the end of the first week during which the free service was given, there was an increase of 490 passengers over the average carried previously. The saying that people will ride a free horse to death has not proved true in this case. The people appear to understand that even tho the merchants have not advertised the service as a tradegetter, it is being paid for thru an assessment upon the merchants, and they realize, therefore, that it is an indirect invitation to them to shop in Titusville.

The merchants report that the free trolley service brings people into the stores during the morning hours when business is usually quiet and when the storekeepers can give more time to their individual wants. They also observe that the greater number of people on the streets and in the stores increases the spirit of hustle and animation and creates precisely the psychological effect which they so much desire. To check up the results in increased buying, one has only to visit the office of the

Rear wheel of the Sterling seven-ton Monarch of Motor-truckdom, the biggest, most powerful rear wheel on any motor truck.

Sterling Staunchness and Stamina

STERLING Trucks—from 2½ to 7 tons—are engineered on the steel railway builders' ideas of staunchness. They're massively proportioned—giants in streng staunch and sturdy, with stamina to stand the gaff and perform under unusual conditi

Massiveness in Sterling Trucks is gained by real scientific proportioning — stre where strength is needed. Twenty to forty per cent greater proportions are obtaine the Sterling with from 10 to 20 per cent less weight. That means economy of opera

WRITE FOR COST FIGURES OF MOTOR TRUCK OPERATION

Sterling TRUCKS

STERLING MOTC
TRUCK COMPAN

Builders of Motor Trucks Exclusively for Nine

830 ROGERS STREET, MILWAUKEE,

PHILLIPS UNIVERSITY LIBRARY

Traction Company during the hours of departure of the free cars and watch the people get on board. They are all carrying parcels, and many of them are heavily loaded down, some of the packages too large for them to carry. The contract with the Traction Company provides for the free transportation of bulky articles which the customers cannot carry.

H. B. WATSON,
Managing Secretary, Titusville Chamber of Commerce.

Saint Paul's War Activity Program

Saint Paul, Minn.—At the annual meeting of the Saint Paul Association, held on January 11, the necessity for giving every possible help to the National Government in its prosecution of the war was proclaimed to be of greater importance than any other object which the Association might seek to accomplish. The Vice-Chairman of the War Work Division outlined on a 30-foot chart the war activity program which the Association had mapped out for itself for the year 1918.

The chart shows the three main divisions of the Association's work—Public Affairs, Business Affairs, and Association Affairs—and shows thru which units the various war activities will be administered. The war activity program includes Association effort in connection with the Liberty Loan; War Savings Certificates; Military Training Camps Association; Reserve Officers' training camps; Aviation and Balloon Corps recruiting; Quartermasters' Reserve Corps; Intercollegiate Intelligence Bureau; Ordnance Department recruiting; Red Cross; War Camp Recreation Service and the recreation work of the Y. M. C. A. and Knights of Columbus; Public Service Reserve; commercial economy; river navigation; food production, conservation, distribution and price regulation; Fuel Administration; Industrial Mobilization for War; Labor Supply; Four-Minute Men, both local and state; war information service thru the schools, public meetings, motion pictures and the press; assistance to the war work of women thru the Women's Auxiliary of the Safety Commission; and the continuance of Association service to the Ramsey County Division of the Public Safety Commission.

The highly patriotic character of the meeting is indicated in the address of C. H. Bigelow, the new President of the Saint Paul Association, in which he asked that social, business and public affairs be subordinated to the great task of winning the war, and in which he made the following strong appeal to the members:

"To the performance of its duties one should give the best there is in him. This I promise to give, but I should not be willing to give such a promise if I did not believe that in the minds of all of our members the only thing of real importance at this time is the successful prosecution of the war, and if I did not believe that without exception, not only our members, but every other good citizen of this wonderful city of Saint Paul, is willing to back with his money and his time any agency as well-equipped as this is to give assistance to Washington in this time of need."

As an earnest of its desire to fulfill its obligation to the nation at this time, the Association adopted the following resolution:

A RESOLUTION

Whereas, Saint Paul, true to its reputation for unflinching loyalty to the principles for which this nation has stood, has unhesitatingly responded to each of the nation's requests for patriotic service since the declaration of war against the Imperial German Government; and

Whereas, The Saint Paul Association of Public and Business Affairs, composed of nearly five thousand business and professional men, has during the past year devoted a large proportion of its facilities to the successful prosecution of this war for democracy; but

Whereas, Every citizen of this country and the American people generally must make even greater sacrifice and larger contributions of substance and self for the nation's preservation and the cause of liberty and humanity during the critical year just ahead;

Therefore, Be it the sentiment of this, the annual meeting of the Saint Paul Association, that we hereby highly resolve to even more unhesitatingly respond to the call of world democracy which at the present moment is in such great distress, and the future life of which so critically hangs in the balance, in order that government "of the people, by the people, and for the people shall not perish from the earth."

MILTON J. BLAIR,
Publicity Secretary, Saint Paul Association.

It Pays to be Observing

Attleboro, Mass.—The Secretary of the Attleboro Chamber of Commerce several months ago saw a reference in a Boston newspaper to the fact that a tuberculosis hospital was to be established somewhere in Bristol County, the county in which Attleboro is located. Thinking that it would be desirable to have such an institution

Amercian-LaFrance Motor Fire Apparatus at Camp Dix, Wrightstown, N. J.

THE NATION'S EFFICIENCY IN THE PRESENT CRISIS

The nation's efficiency in the present crisis depends upon the ability of its industries to produce war materials and supplies, and to continue to do so without interruption.

The burden of protecting the industries of the country against delays and stoppage of production by fires rests upon the Fire Departments. Fire Departments efficiency depends largely upon the reliability and quality of its Fire Fighting Apparatus. *The Best is None too Good.*

Up to this date this company has furnished the United States Government with the following motor fire apparatus:

18 Pumping Cars
38 Chemical Engines
6 Combination Cars
1 Service Truck

—as well as some 200 hand-drawn chemical engines and several thousand hand extinguishers.

AMERICAN-LAFRANCE FIRE ENGINE COMPANY, INC.

Members of the National Automobile Chamber of Commerce. Licensed under the Dyer Patents

Elmira, New York, U. S. A.

Branch Sales Offices and Service Stations

New York Boston Chicago San Francisco Portland, Ore. Dallas
Los Angeles Atlanta Denver Pittsburgh Baltimore Minneapolis

CANADIAN FACTORY, TORONTO, ONT.

brought to Attleboro, he took up the matter with the president of the Chamber and then discussed the possibility with the Mayor. It was found that the state representative resident in Attleboro, Mr. Worrall, was influential with the authorities with whom rested the matter of choosing the site, and he was then approached. After many conferences regarding possible sites, it was decided that Talaquega Park, in Attleboro, met all the requirements of an ideal health resort.

The property, which embraces an area of about one hundred acres, was purchased for $33,000. The park is located in the highest part of eastern Massachusetts, and the transportation facilities of the section are excellent. There are already several buildings on the property, and these will be renovated and utilized for hospital purposes. The old park casino will be the administration building after the improvements have been completed. Beside the casino, there is a large dance hall, a farm house adjoining and a smaller building which was occupied by the superintendent of the park.

It is intended that the resort shall be not only a place where incurable victims of the white plague may find a home, but also a place where the health of many tuberculosis patients may be restored. It is believed that when the present plans for the institution have been executed, it will be one of the best health resorts in the state.

The Chamber of Commerce is very much pleased that it was able to secure this county hospital for Attleboro, which was accomplished by Mayor Sweet and the Secretary, working thru Representative Worrall.

WALTER O. LOCHNER,
Secretary, Attleboro Chamber of Commerce.

Facilitating the Collection of Accounts

Sharon, Pa.—The Merchants' Division of the Sharon Chamber of Commerce has devised a method of assisting its members to make collections of outstanding accounts. It involves the use of a simple rubber stamp reading:

Credit Bureau
MEMBER
Merchants' Div.

This stamp, appearing on a bill, calls attention to the fact that the merchant sending it is a member of the Credit Bureau of the Chamber of Commerce, and carries a delicate hint to the customer that unless prompt payment is made, the merchant will be likely to report the delay to the Credit Bureau. At the same time, there is nothing at which the customer could take offense. It was thought that the use of a rubber stamp such as this would carry greater weight with the customer than it would if the statement of membership were included in the printed matter on the stationery. The Chamber of Commerce sells the stamps, cushioned or uncushioned, to its members at a small cost.

T. C. FITZ GIBBON,
Secretary, Sharon Chamber of Commerce.

Gardeners Give Touching Patriotic Entertainment

Providence, R. I.—A pleasing novelty was introduced at a dinner held by the Retail Merchants' Division last summer. The toastmaster called the guests to order after the dinner to give them the pleasure of witnessing a patriotic performance by the boys and girls of one of the city's grammar schools. The children had formed in procession outside and marched in, singing, led by a farmer, who carried an American flag. Immediately following him came a company of school girls, each of whom wore a Cap of Liberty and a red, white and blue costume and carried a French flag, a hoe and a rake. Next came a farmer boy trundling a wheelbarrow, then ten more boys, dressed as farm hands, each carrying a shovel, and last of all, another boy with a barrow. This company represented the "Rhode Island National Gardeners."

They sang the following words to the air of "The Marseillaise" as they marched:

Arise, ye children of the Nation,
The day of glory now behold.
In our faces cruel oppression
Doth her bloody banner unfold,
Doth her bloody banner unfold.
Do ye not hear? Hark! How her minions roar
While thru your valleys they roam.
They enter now your very home
To destroy your sons, your companions.
To farms! To farms, ye brave!
To plow and plant the seed!
March on! March on! All hearts resolved
To meet the Nations' need.

The performance was so heartily ap-

City of Lapeer
R. F. FRAY, MAYOR

LAPEER, MICHIGAN. April

South Bend Motor Car Works
South Bend, Ind.

Attention Messrs. Mecklenburg & Scott.
Gentlemen:

I am writing this letter to let you know that you about 24 hours early with your Munsey Committee, as last n Lapeer experienced the most disastrous fire ever known in history.

An alarm was turned in at 6.30P.M. and we put the pum to work immediately, drawing from the river. She did conti service for about 8 hours and saved the city of Lapeer at two valuable stores, amounting to a good many times the pr of the entire equipment.

This morning our most radical knockers against the pu of the machine frankly told me that the machine did not ow city of Lapeer a cent.

It certainly did admirable and efficient service for continuous work.

Very truly yours,

R. F. Fr

RFF/KB

Mayor

—AND NOT ONLY IN LAPEER

but in every city where South Bend Double Duty Apparatus is installed. They perform that same efficient, conscientious service. They are dependable—and that's what counts in F Apparatus. Write us for booklets.

The South Bend Motor Car Works South Bend, I

FABRIC FIRE HOSE

is of an unusually careful manufacture

WAX and PARA GUM TREATED

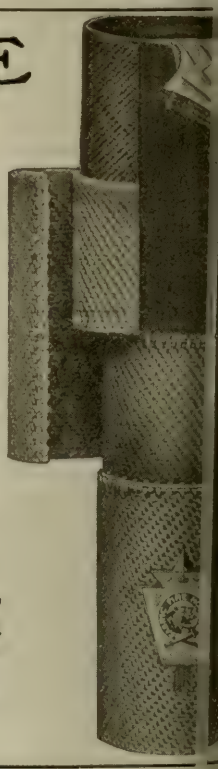
The lining is of fine Para Gum, hand made, four calendered, smooth bore or lap-jointed

Circular balance woven, each strand of cotton is treated to a bath of melted Wax and Para Gum, then cabled and woven into the jackets.

Absolutely waterproof, making the ideal hose for fire departments.

Treatment lubricates and solidifies the strands of cotton, assuring long wear.

Made in all sizes from 1 to 6 inches inside diameter.



FABRIC FIRE HOSE CO.

COR. DUANE & CHURCH STS., NEW YORK

Branch Offices

CHICAGO	OKLAHOMA CITY	ELMIRA, N. Y.	MONTREAL
ATLANTA	PORTLAND, ORE.	BINGHAMTON, N. Y.	PROVIDENCE
COLUMBUS, O.	SAN FRANCISCO	PITTSBURGH	DALLAS, TEX.
MINNEAPOLIS	BALTIMORE, MD.	NEWARK, N. J.	

Patentee and Sole Manufacturer

plauded that the children were obliged to return and repeat it. This time the dinner guests joined them in the singing. The scene was so touching and the singing of the children so beautiful that many were moved to tears.

H. NELSON STREET,
Secretary, Retail Merchants' Division, Providence Chamber of Commerce.

BOARD OF COMMERCE of MANCHESTER, N. H.

Civic Enterprise Certificate

Be it known that _____ has participated in the activities of "Clean Up Campaign," 1917, and in recognition of _____ labor and interest _____ is given this certificate for Civic Enterprise.

[SIGNED]

Teacher.

Harry W. Spaulding
Mayor of Manchester.

Herbert F. Taylor
Superintendent of Schools

Manchester, New Hampshire

R. E. Marden
President Board of Commerce

THE CIVIC ENTERPRISE CERTIFICATE AWARDED TO THE SCHOOL CHILDREN OF MANCHESTER, N. H., FOR THEIR WORK IN THE 1917 CLEAN-UP CAMPAIGN

Manchester's Clean-up and Paint-up Campaign

Manchester, N. H.—The civic enterprise certificate herewith reproduced was given to the school children of Manchester who spent five hours or more in clean-up work during the week of May 7 to 13, 1917. The certificate, it will be observed, was signed by the Mayor, the Superintendent of Schools and the President of the Board of Trade. Prizes of $5, $3 and $2 were also awarded for the best three essays by the children on "The City Beautiful."

In preparation for the week, 2,500 cards on which to record the location and particulars in regard to neglected conditions were distributed in the schools and elsewhere in the city by Boy Scouts. One card which was returned told of a neglected privately owned cemetery in the older part of the city, in which Revolutionary and Civil War soldiers were buried. The matter was investigated, the cemetery was put in good order, and action was taken toward having the city take it over.

A parade was held on Monday of Clean-up and Paint-up Week in which all the city departments and local organizations interested in the work were represented. Friday of that week was observed as Arbor Day and literature was sent out broadcast urging the property owners to plant flower and vegetable gardens and to set out trees, shrubs, etc.

The Boy Scouts went out several days after the property owners had been notified to clean up their premises and found that out of the 190 cases of neglected conditions

For Fire Apparatus

Hard Base Cushion
Removable or Pressed

OWING to the remarkable traction resilience and durability of the Firestone Hard Base Cushion (Removable or Pressed-On) Tires in truck service, they are now being furnished in sizes suitable for Fire Department Service.

They insure safety, speed and reduced vibration.

Firestone TIRES

Hard Base
Removable or Pressed-On

For similar reasons and for the resistan side strains to which tires in Fire Departi are subjected the Firestone Hard Base Presse or Removable Tire is made in the proper

Fire apparatus Firestone equipped be more efficient, the drivers have more confi to take the corners at high speed, the g the road reduces slippage and skidding.

The nearest Firestone Branch Office will give details of construction and eviden durability under severe service.

FIRESTONE TIRE AND RUBBE COMPANY, AKRON, OHI

Branches and Dealers Everywher

eported on the cards, 130 had received roper attention. Manchester won the cup the New England Clean-up and Paint-up ontest.

WILLIAM A. SEARLE,
Executive Secretary, Manchester Board of Commerce.

✣ ✣

Federal Health Service for Fort Worth

FORT WORTH, TEX.—Realizing the direct nd indirect benefits to be derived by coperating with the United States Public ealth Service, the Chamber of Comerce obtained the initial financial suport necessary to induce the Federal epartment to undertake extra-cantonent zone sanitary work here. At the esent time there is an active working rce of thirty-two in the cantonment, ur the command of Major J. H. Oakley. his force is soon to be increased to at least rty-five. In undertaking the work it was cessary to incorporate the City Health epartment into the Government service, nd the wisdom of this action is unquesoned. Thus the Red Cross and the County ealth Department, with their additional rps of workers, are placed directly under e United States health official.

The work performed has been departentalized under the following heads: Milk d Dairy Inspection, Meat Inspection, hool Medical Examination, House to ouse Survey, Hotel, Restaurants and fés, Red Cross Unit, and Complaint. his means that medical examination is afrded every school child by experts ained in this line of work. These exrts will also make suggestions for the ssible improvement of the school buildgs, the lighting and ventilation of them, c. The Red Cross unit will inspect all ntagious diseases, formulate orders regrding them and follow up the cases until charged. The work is to be augmented rural surveys, which will be conducted coöperation with the state and county cials, a venereal clinic, and anti-mosto malarial work. Orders have been reved to undertake also sanitary control of shores of our large municipal lake.

The cost of this work is small compared h the results which will be obtained. e United States Public Health Service only one of the material benefits the citizens of Fort Worth are deriving by having Camp Bowie, a national guard cantonment, located here.

L. A. GREENE,
Publicity Commissioner, Fort Worth Chamber of Commerce.

✣ ✣

Curbing the Rumor-Monger

ELMIRA, N. Y.—The Elmira Chamber of Commerce is making an effort to check the spread of rumors which are being circulated from time to time reflecting upon America's state of preparedness for war, or reflecting upon the ability of the administration to conduct the war wisely; in fact, to discourage as much as possible the circulation of stories which may have no foundation in fact, and which will benefit or give comfort to the enemy. For this purpose the Chamber had the little card printed which is reproduced below. It measures

> ***Do You KNOW It is True?***
>
> **Be Careful. The Stories You Help Spread May Benefit the Enemy.**
>
> ***Elmira Chamber of Commerce***

two and three-quarters by one and one-half inches. The cards were distributed among the members, who carry them around in their pockets and quietly hand them to individuals who may be trying to relate such stories.

JOHN E. BALLY,
Secretary, Elmira Chamber of Commerce.

✣ ✣

How to Produce More Wool

MADISON, WIS.—The Wool Conservation Committee of the Madison Association of Commerce is actively engaged in an effort to help meet the Government's demand for "more sheep and more wool." It has been found that our wool demands for the year 1918 aggregate 800,000,000 pounds and that our available supply is only 285,000,000 pounds. The states of the Middle West are being urged by the Federal authorities to stimulate the production of wool by forming boys' and girls' sheep clubs. Wisconsin is one of the states that is particularly adapted to this work. A plan has been worked out by the Wool Conservation Committee of the Association of Commerce which is to be put

Republic Fire Hose Stands Up

Republic Fire Hose has made good in the hardest kind of service.

It stands up against rough usage.

Fire chiefs generally recognize its wearing qualities.

The cotton jackets are woven by our own experts from the best yarns obtainable.

The rubber linings are compounded from formulas that are the result of years of experience in building fire hose.

Republic Fire Engine Suction Hose is light and flexible and will withstand the most severe pumping strain

The Republic Rubber Corporatio

Youngstown, Ohio

Branches in all principal cities

into operation in every county in the state. Copies of the plan may be obtained by writing to the Secretary of the Association of Commerce.

DON E. MOWRY,
Secretary, Madison Association of Commerce.

War Declared on Sheep-Killing Dogs

Asheville, N. C.—The Agricultural Division of the Asheville Board of Trade is carrying on a vigorous campaign in the interest of sheep-raising in this section. One of the great drawbacks to the successful pursuit of the industry is the prevalence of sheep-killing dogs, which hinders the raising of sheep and prevents many farmers from engaging in this profitable industry. It is estimated that there are twelve thousand dogs in the county, an average of one to a family, which results in an enormous economic waste in consumption of food and in the destruction of food of various kinds. The Agricultural Division unanimously adopted a resolution urging the passage of a law taxing dogs, the revenue derived therefrom to be used as a fund out of which to pay for damage done by the dogs. The two senators from North Carolina and the representative from this district have been asked to secure the federal tax as a war measure. If enacted, it will eliminate a great many worthless dogs.

N. BUCKNER,
Secretary, Asheville Board of Trade.

Recently Issued Printed Matter

Akron, Ohio.—The *Bulletin* of the Akron Chamber of Commerce, referring to the recent annual meeting of the Akron Chamber, giving photographs of previous presidents of the Chamber and an outline of the important features of their administrations, also enumerating a few of the Chamber's increasing activities, and giving figures showing Akron's growth.

Atlanta, Ga.—"How to Organize and Build a Local Chamber of Commerce," bulletin No. 5 of the Georgia Chamber of Commerce, whose headquarters are at Atlanta.

Boston, Mass.—Supplement to the Chamber's Bulletin, *Current Affairs,* giving the closing time of mails at the main postoffice and at the larger stations and branches in Boston, and containing advice to the public to mail letters frequently rather than wait until 5 o'clock, when the postoffices are busiest, a procedure which will avoid congestion and insure prompt delivery of mail.

Butler, Penn.—A pamphlet entitled "What It Is, The Object, How It Works, Work Done in 1917," published by the Butler Chamber of Commerce.

Carlisle, Pa.—The annual report of the Carlisle Chamber of Commerce for the year ending December 31, 1917.

Cleveland, Ohio.—"The Cleveland Homes Company, A Plan for Housing Cleveland's Workers," is the title of the address made by Paul L. Feiss before the Cleveland Chamber of Commerce last fall, issued in pamphlet form.

Des Moines, Iowa.—The report of the Housing Commission of the City of Des Moines, rendered upon completion of the survey of housing conditions in Des Moines which was made under the direction of the Housing Commission, in coöperation with the Des Moines Housing Association and the Chamber of Commerce. (Address R. H. Faxon, General Secretary, Des Moines Chamber of Commerce.)

Fort Collins, Colo.—The annual report of the Fort Collins Commercial Club.

Fredericksburg, Va.—A folder entitled "Some Reasons Why You Should Visit Fredericksburg, Va., the Historical City of America," contains pictures of historical centers and facts in regard to Fredericksburg, and is published by the Chamber of Commerce.

Middletown, N. Y.—The annual report of the secretary of the Middletown Chamber of Commerce for the year ending November 1, 1917.

New York City.—A pamphlet issued by the Merchants' Association, containing a summary of the readjustments made by English manufacturers on account of the war, as explained in the conferences between American manufacturers and a commission sent to this country by the British Ministry of Munitions.

New York City.—The annual report of the Board of Trustees of the City Club of New York is contained in the December issue of the City Club's *Bulletin.*

Parkersburg, W. Va.—"A Brief Report of the Activities of the Parkersburg Board of Commerce to Its Members and All Forward-Looking Citizens," published by the Parkersburg Board of Commerce.

Piqua, Ohio.—"A Summary of the More Important Activities of the Piqua Chamber of Commerce for the year 1917," published by the Piqua Chamber of Commerce.

Providence, R. I.—The Providence Chamber of Commerce is coöperating with the city postmaster in an attempt to overcome the congestion at the Post Office late in the evening, by sending circular letters to its members urging those who send out large quantities of mail to dispatch it at frequent intervals during the day "instead of persisting in the unreasonable custom of holding all mail until late in the afternoon."

Saint Paul, Minn.—"A Summary of the More Important Activities of the Saint Paul Association During the Year 1917," published by the Saint Paul Association.

Stockton, Cal.—"Some Things Done by the Stockton Chamber of Commerce," a report of the activities of the Chamber of Commerce for 1917.

—yes, some twenty years ago

Twenty years ago, we made a big lot of Enameled Iron Street Signs for the City of Baltimore, but we haven't sold the City many since—only because

THE TOWN HASN'T NEEDED THEM

The signs we sold them twenty years ago are still doing business—that's the economy of "BALTO" Guaranteed Porcelain Enameled Iron Municipal Signs.

That's the proof that there is no "just-as-good."

If you can afford to experiment with low prices (?) you're fortunate, but the taxpayer pays the freight. Our product is the one absolutely dependable out-of-door municipal sign on the market, and we can prove it if given half a chance.

GIVE US THE CHANCE TODAY

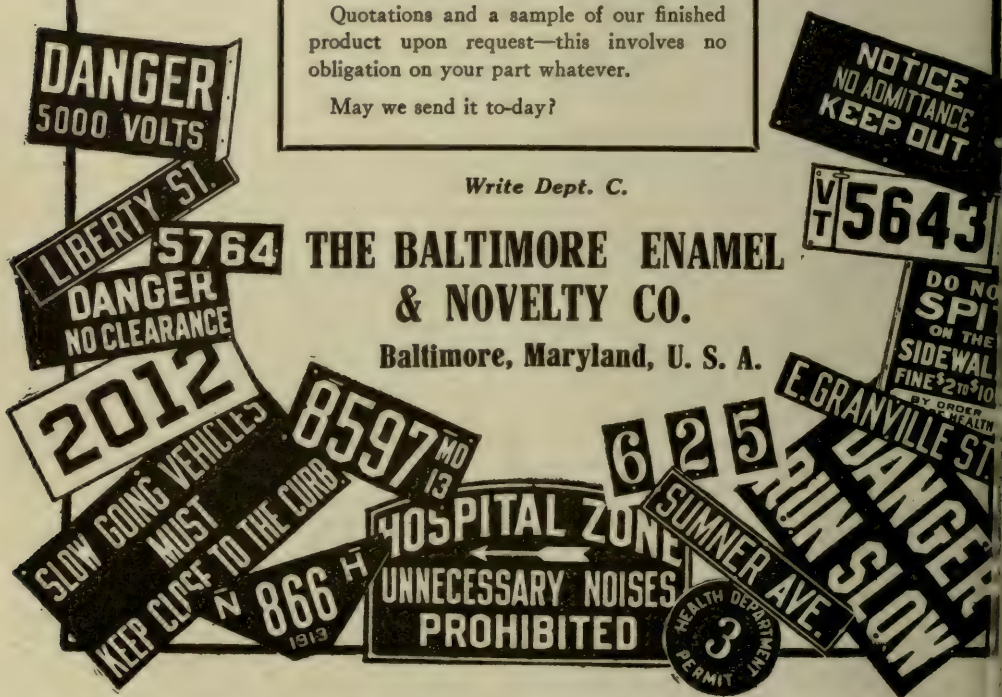
Quotations and a sample of our finished product upon request—this involves no obligation on your part whatever.

May we send it to-day?

Write Dept. C.

THE BALTIMORE ENAMEL & NOVELTY CO.

Baltimore, Maryland, U. S. A.



Municipal and Civic Publications

ACE, JOSEPH, F. I. C., City Bacteriologist and Food Examiner, Ottawa, Can.

The Examination of Milk for Public Health Purposes. 1918. vi + 224 pp. Charts, statistical tables. **$1.90**

This volume is intended primarily as a practical ndbook for those engaged in the chemical and bacriological examination of milk for public health purses, but it should also prove of material assistance students and others who already possess some owledge of the technique of bacteriology. The conol of milk supplies was formerly confined to chemil examination for adulteration, but in America to-day e tendency is to have both chemical and bacteriologil examinations made under the supervision of the blic health authorities. An attempt is made to inade all methods of bacteriological examination that ve been proved reliable, and tables of bacteriological sults have been added in the hope that they will lead the standardization of records. Some of the chapter ads are: Constituents of Milk; Normal Composition; emical Examination; Bacteria in Milk; Enumeration Bacteria; Excremental Organisms; Pathogenic Ornisms; Cells, Dirt and Débris.

ATIONAL HOUSING ASSOCIATION.

Housing Problems in America: Proceedings of the Sixth National Conference on Housing, Chicago, October 15-17, 1917. (Proceedings of the National Housing Association, VI.) 1917. xii + 462 pp. **$2.00**

The papers and discussions of the sixth annual eeting of the National Housing Association are in rge part devoted to the subject of industrial housing account of the overwhelming importance which this bject has assumed since the outbreak of the war. hn Nolen contributes a paper on "What England as Done in War Housing," and the general subject "Housing as a War Problem" is treated by Charles . Whitaker, Philip Hiss, and Harlean James. Under e caption "Housing Famines," Messrs. Conrad earer, William H. Ham and Robert E. Lee tell how eir respective communities—Kenosha, Bridgeport and kron—grappled with their housing shortages. Other pers on this subject were presented by Leslie H. llen, John E. Conzelman, Richard H. Dana, A. E. wen and Leifur Magnusson. The various aspects of unicipal housing work were considered by James F. cCrudden, Henry F. Vaughan, John D. Robertson, ernard J. Newman, and Albion F. Bacon. A paper "The Real Estate Man and Housing" was given by red G. Smith, and one on "The Zoning of Cities," by awson Purdy. Five interesting papers were prented on "Chicago's Housing Problems," and the ok contains also a series of discussions, and reports housing progress of the year.

ATIONAL CONFERENCE OF SOCIAL WORK

Proceedings of the National Conference of Social Work. Forty-Fourth Annual Session, Pittsburgh, Pa., June 6-13, 1917. 686 pp. **$2.15**

Convening the day after the initial military registraon in this country, the social workers at this conrence were not in a position to foretell the new contions which would result from America's participaon in the war. Nevertheless, the need for consultaon was evidenced by an unprecedented attendance, ore than four thousand delegates registering. The ogramme was divided into main subject heads as llows: Social Problems of the War; The Family d the Community; Health; Children; Public Charies; Mental Hygiene; Community Programs; Social nsurance; Corrections; Rural Social Problems. The ok contains about one hundred lectures and addresses covering practically every aspect of social and charitable endeavor.

JACKSON, DUGALD C., and MCGRATH, DAVID J.

Street Railway Fares: Their Relation to Length of Haul and Cost of Service. (Research Division Bulletin, No. 14, Massachusetts Institute of Technology.) 1917. **xiv + 169 pp. Maps, charts, tables. $2.65**

This book comprises data collected and conclusions reached by the authors in the course of study carried on in the Research Division of the Electrical Engineering Department of the Massachusetts Institute of Technology on the subject of major factors of street railway traffic which influence the cost of carrying the average passenger and the manner in which these factors affect the practicability of making long hauls for five cents in ordinary street railway service.

WOOLSEY, THEODORE S., JR., M. F., Assistant District Forester, United States Forest Service.

French Forests and Forestry. (Tunisia, Algeria, Corsica.) 1917. Photographs, tables. xvii + 238 pp. **$2.65**

In this period of renewed insistence upon every phase of conservation, Mr. Woolsey's book is particularly timely and should be of interest and assistance to municipal foresters and park superintendents thruout the country. The book divides itself naturally into three main sections, devoted to Tunisia, Algeria and Corsica, and describing forest conditions, administrative organization and legislation, and forest management in each of these countries.

AMERICAN ASSOCIATION FOR ORGANIZING CHARITY, 130 East Twenty-second Street, New York City.

Financial Federations. The Report of a Special Committee. 1917. 285 pp. **$1.00**

A committee of prominent social workers has made a study of the financial federation plan as now worked out in American cities and has reported its findings in this important study. Federations have been formed in twenty cities, in six of which they have been abandoned. The committee, after studying the facts at its command, registers its opinion that it is unadvisable at this time for other cities to take up this plan. Fourteen cities are now experimenting, and until their experiments conclusively show the plan to be advantageous it would be unwise for other cities to adopt it. The main objections stated are as follows: While financial success appears to be usual in the initial stages (except where there has been inadequate preparation), this success is much less surely shown when later years are taken into account. There seems also to be a tendency towards a loss of interest on the part of the public after the first period of activity. Finally, while there have undoubtedly been gains, these gains have been based upon methods of financial work which "do not tend to build up as stable a constituency as most organizations in nonfederation cities now have."

MEREDITH, JOHN REDMOND, K. C., and WILKINSON, WILLIAM BRUCE, K. C.

Municipal Manual. (Edited by Sir William Ralph Meredith, Chief Justice of Ontario.) 1917. xxxiv + 1,040 pp. **$20.00**

Owing to a misapprehension, the price of this volume of Canadian municipal information was incorrectly stated as $10.00, in the December issue of THE AMERICAN CITY.

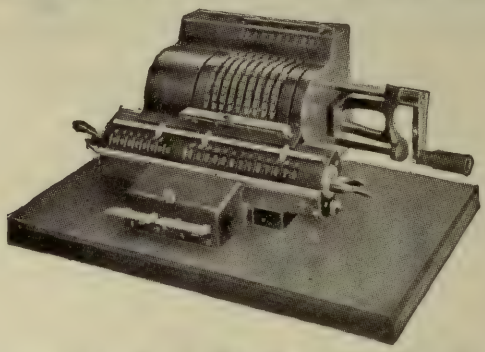
CITY OFFICERS

AUDITORS, CLERKS, ENGINEERS, SUPERINTENDENTS OF STREETS

Do away with waste of time and the possibilities of costly errors by using

Speed

Accuracy



Ease of

Operation

The New Pony Marchant Calculator

The Marchant is used throughout the United States in the following classes of calculations: Tax Extension, Decreasing or Increasing Valuations, Figuring Interest on Tax Delinquencies, Apportioning Funds of Treasurer, Apportioning of School and Road Funds, Bond and Redemption Interest all Classes of Engineering Calculations and also for New and Old Bridge Work Calculations. For further information write:

Marchant Calculating Machine Company

EMERYVILLE Fourth Street OAKLAND, CAL.

Eastern Representative, 461 Drexel Building, Philadelphia, Pa.

MOTT LAMP POSTS

STANDARDS OF MERIT

Special Designs of Lighting Standards For Type C Lamps

LAMP POSTS FOR ALL REQUIREMENTS

FOUNTAINS

Display and Drinking

For PUBLIC SQUARES, PARKS, PLAYGROUNDS, Etc.

ENTRANCE GATES, RAILINGS, SETEES

CATALOGUES ON APPLICATION

THE J. L. MOTT IRON WORKS

Fifth Avenue and 17th Street, New York

Pamphlets and Papers of Civic Interest

See also the department of News and Ideas for Commercial and Civic Organizations

Survey of City Government of Richmond, Va.

Summary of Recommendations, Including Chapter on Organization from Report of a Survey of the City Government of Richmond, Va. Prepared for the Civic Association of Richmond by the Bureau of Municipal Research, New York City, 1917. 80 pp. Charts. (Apply to D. R. Anderson, Executive Secretary, The Civic Association, Richmond, Va.)

Salary Standardization in Akron.

The Bureau of Municipal Research of Akron has prepared a comprehensive "Report on Standardization of Salaries and Grades for the City of Akron, with Recommendations," which was submitted to the Finance Committee of the Common Council, November 12, 1917. 65 pp. (Apply to Don C. Sowers, Director, Bureau of Municipal Research, 727 Second National Building, Akron, Ohio.)

Chicago's Financial Dilemma.

Under this title is issued the Reply of the Chicago Bureau of Public Efficiency to a Letter from the Chairman of the Committee on Finance and the City Controller asking Civic Organizations to Cooperate in Urging a Special Session of the Legislature to Provide Financial Relief for the City. December, 1917. 23 pp. (Apply to Harris S. Keeler, Director of the Bureau, 315 Plymouth Court, Chicago, Ill.)

The Health of Food Handlers.

This is the title of an interesting coöperative study by the New York Department of Health, the Metropolitan Life Insurance Company and the American Museum of Safety, the report itself having been prepared by Louis I. Harris, M. D., Chief, Division of Industrial Hygiene, Department of Health, and Louis I. Dublin, Ph.D., Statistician, Metropolitan Life Insurance Company. Published as Monograph Series Number Seventeen, of the New York Department of Health. 24 pp. (Apply to the Department, Centre and Walker Streets, New York City.)

A Social Club With a Civic Purpose.

This is how Mr. Henry G. Hodges, secretary of the City Club of Cleveland, defines this institution in a recent pamphlet entitled "The City Club Idea." (9 pp.) Those interested in this subject should apply to Mr. Hodges as above.

Constructive Community Service in New York City.

Twentieth Anniversary Year Book of the People's Institute of New York. Edited by Gertrude S. Borchard. 1918. 79 pp. Photographs. (Apply to Edward F. Sanderson, Director of the Institute, 70 Fifth Avenue, New York City.)

Municipal Reports of Santa Rosa, Cal.

Municipal Reports of the City of Santa Rosa for the Fiscal Year 1916-17, together with Directory of City Officials and Miscellaneous Data. Prepared by Henry B. Snyder, City Clerk, to whom application for copies should be made. 1917. 31 pp.

Liquor Traffic in Boston and New York City.

Report to the Mayor and Aldermen by the Committee on License, Chicago City Council, on the Public Licensing, Regulation and Control of the Liquor Traffic in Boston and New York City. December, 1917. 58 pp. (Apply to Alderman John Toman, Chairman of the Committee, Chicago, Ill.)

Water Supplies and the Public Health Officer.

Supervision of Public Water Supplies by the Health Officer. Jack J. Hinman, Jr., M.Sc. (Reprinted from *The Journal of the Iowa State Medical Society*, November, 1917.) 16 pp. (Apply to author, State University, Iowa City, Ia.)

Governmental Efficiency in Springfield, Ill.

City and County Administration in Springfield, Illinois: A Survey by the Department of Surveys and Exhibits, Russell Sage Foundation, D. O. Decker and Shelby M. Harrison. (Springfield Survey, SE 13, October, 1917.) Photographs, diagrams, statistics. 158 pp. (Apply to the Foundation, 130 East Twenty-second Street, New York City.) 25 cents.

New York's Probation Service.

Developments of Ten Years in New York's Probation Service. Address of President Homer Folks upon retiring from the State Probation Commission. 1917. 15 pp. (Apply to State Probation Commission, Albany, N. Y.)

Comprehensive Annual Health Report.

The Annual Report of the Surgeon-General of the Public Health Service of the United States, 1917. 387 pp. With summaries, figures and diagrams showing health conditions over the entire world in relation to the United States and with data on investigations carried out by the Public Health Service thruout the country. (Apply to Surgeon-General, U. S. Public Health Service, Washington, D. C.)

Milk Distribution in the City of Chicago.

Report on the More Economic Distribution and Delivery of Milk in the City of Chicago, by the Committee on Health, Chicago City Council. (Municipal Reference Bulletin No. 8, December, 1917.) 15 pp. (Apply to Frederick Rex, Librarian, Municipal Reference Library, City of Chicago, 1005 City Hall.)

City Budget Facts, 1917.

This is the title of a recent graphic report comprising "An Analysis of Toronto's Budget for 1917," compiled by the Toronto Bureau of Municipal Research, 813-820 Traders Bank Building, Toronto, Canada. 24 pp. Charts. (Apply to Horace L. Brittain, Managing Director of the Bureau as above.)

Civil Service Plan for Milwaukee County.

Civil Service Plan for the County of Milwaukee, Including Classification and Standardization of Personal Service, Civil Service Rules and Regulations and Constructive Recommendations for Positive Employment Administration. Prepared on the Authorization of the Milwaukee County Board of Supervisors by the Milwaukee County Civil Service Commission, November, 1917. 196 pp. (Apply to the Commission or to J. L. Jacobs & Company, Monadnock Building, Chicago, Ill.)

War Gardening and Home Storage Manual.

War Vegetable Gardening and the Home Storage of Vegetables: Part I—War Gardening Manual; Part II—Home Storage Manual. 1918. 31 pp. Illustrated. Published by the National War Garden Commission, The Maryland Building, Washington, D. C., from which organization copies may be obtained upon application.

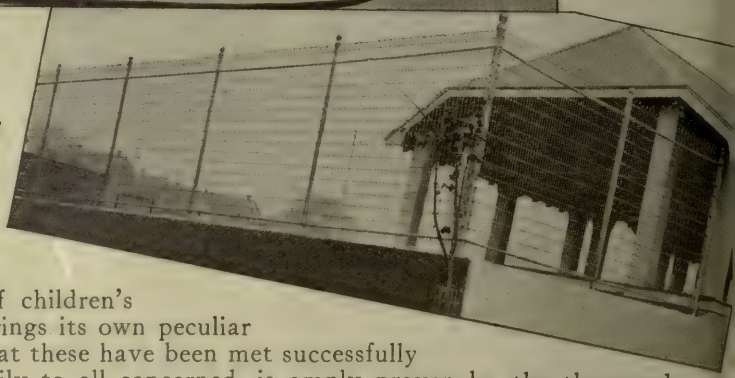
National Service Handbook.

Under this title the United States Committee on Public Information has issued a 246-page handbook containing valuable and reliable information on all branches of service, military and non-military. Civic and chamber of commerce workers should find this book of great assistance. 1917. (Apply to the Committee on Public Information, Washington, D. C.)

Birth and Death Registration Enforcement in Metropolitan Areas.

The Enforcement of Registration of Births and Deaths in Metropolitan Areas—History, Methods, Results and Checks. By William H. Guilfoy, M. D., Registrar of Records, New York City Department of Health. (Reprint Series, No. 61, of the New York City Department of Health.) 7 pp. (Apply to the Director, Bureau of Public Health Education, Department of Health, corner Centre and Walker Streets, New York City.)

The Fence of Durability and Beauty



The fencing of children's playgrounds brings its own peculiar problems. That these have been met successfully and satisfactorily to all concerned, is amply proven by the thousands of illustrations of various kinds. The three shown here are simply three different examples of the use of

"EXCELSIOR" TRADE MARK RUST PROOF FENCE

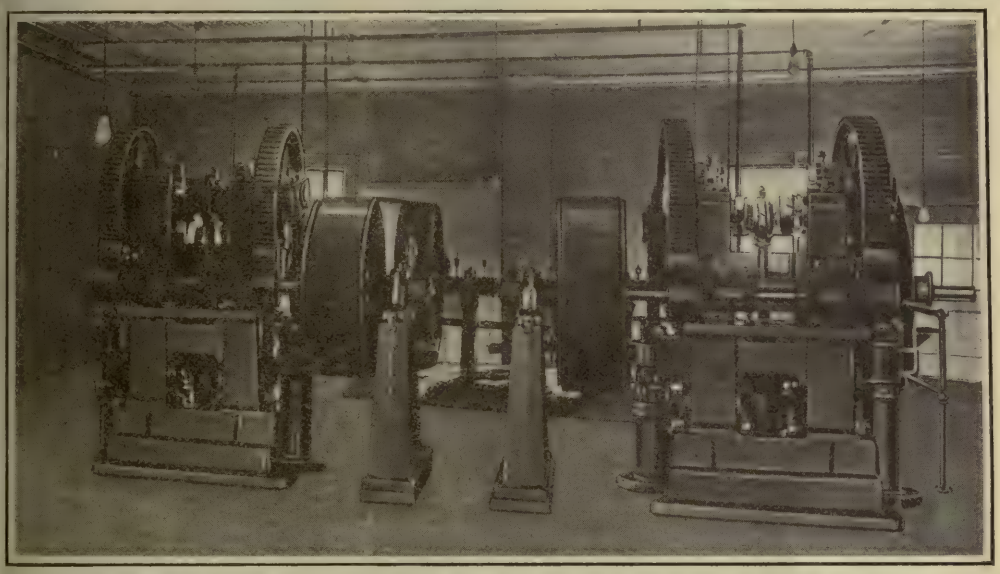
Woven of heavy steel wires, held securely together by the EXCELSIOR patented steel clamp. Galvanized AFTER making which makes it rust proof as well as solders the whole together. Made in many styles and sizes of mesh. *Write for Catalog G*

For all park, and similar uses, there is a complete line of flower bed guards, tree guards, arches, trellises, etc.

WRIGHT WIRE CO.
WORCESTER, MASS.

Methods, Materials and Appliances

News From Boards of Public Works, Engineers, Contractors, Purchasing Agents and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings



PUMPING EQUIPMENT OF THE MUNICIPAL WATER-WORKS, BEAVER, PA.

The Pumping Plant at Beaver, Pa.

The accompanying illustration shows the pumping equipment of the municipal water-works at the installation in Beaver, Pa., designed and manufactured at Salem, Ohio. The Deming single-acting triplex plunger pump was designed for use in open wells where it is necessary to have the water end of the pump placed below the surface of the ground, either because the level of the water is below the suction limit of the pump if placed at the surface, or to insure freedom from freezing. The power end is installed at the surface, being mounted on "I" beams, and is connected to the water end by heavy iron tie beams.

It may be stated that the rods connecting the plungers with the crossheads are made either of pipe or of solid steel, to suit the conditions. Where the depth of the well requires it, guides are provided for the rods at frequent intervals. The power end is particularly well adapted for the different types of drive by electric motor or gas engine, the latter form of power being used in this plant.

✣ ✣

Consulting Engineer Engaged for New Government Plant

Information has been received that the United States Government has engaged the services of Alexander Potter, C. E., 50 Church Street, New York City, to act as consulting engineer in the design and construction of the sewerage, drainage and water supply systems for the new United States Government plant to be located near Charleston, W. Va., and upon which the Government will expend some sixty millions of dollars.

✣ ✣

Road Development a Patriotic Duty

Discussing suggestions that all road work in the state of Oregon be stopped during the war period, Simon Benson, President of the Oregon State Highway Commission, says he has observed that the suggestions came from those who had always been opposed to highway development and other public improvements.

"Owing to the necessity of increasing our transportation facilities," he continues, "it seems to me that it is a high patriotic duty to go ahead with the improvements of our main trunk roads. In this connection I note that the Council of National Defense has appointed a highway transportation committee to work in coöperation with local highway authorities to relieve the burden of the railroads thru the development of a greater use of the highways and inland waterways.

"It is proposed to encourage the use of motor trucks for short distance transportation. This would strongly indicate that the National Council of Defense would not approve the sus-

SPRACO PNEUMATIC PAINTING EQUIPMENT

SAVE LABOR
AND
HELP WIN THE
WAR

SPRACO
EQUIPMENT
WILL DO IT

SPRACO REVOLUTIONIZES PAINTING METHODS

THE Spraco pneumatic painting outfit is one of the most recent devices for reducing paint costs. The Spraco paint gun is a practical hand tool for use in applying all kinds of liquid coatings to smooth or rough surfaces.

The paint is "shot" on. Better work can be done in one-quarter the time required by the old hand-brush methods. The paint gun may be attached quickly to a fibre extension pole, by means of which the operator may reach inaccessible surface, such as walls and ceilings of buildings, without the use of staging.

Ideal for all kinds of municipal painting and coating.

It's a great labor, time and money saver.

Write for complete information.

SPRAY ENGINEERING Co

91 FEDERAL ST. BOSTON, MASS.

sion of reasonable highway work and ther add to the railroad congestion."

n reply to the contention that more men uld be available for the sawmills and ging camps if road work were suspended, Benson asserts that but few men who are rking on the roads would be willing to go the lumber camps.

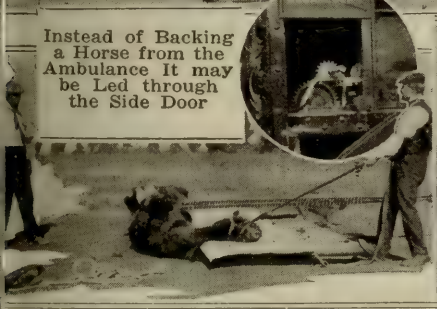
Of course," he concludes, "there is reason all things. Any unnecessary work should be undertaken, but where an improvement l be instrumental in enlarging our facilities bring our food products to market, thus aid- the defense of the nation and assisting our es, it ought to be continued."

✣ ✣

ı Ambulance for Sick Horses

A well-designed ambulance for sick horses s been used by the Los Angeles Humane imal Commission for several years with eat success. It consists of a special body ılt on a 1½-ton Federal truck.

Among the carefully planned devices for se- ring the comfort of the wounded animal in ansit is an arrangement whereby the horse ay be suspended so that his weight is entirely moved from the floor. The door in the back f the ambulance is hinged at the bottom, and hen open forms a gentle incline up which a ippled horse may be led. In case of a badly ippled animal, a moving platform is provided the bottom of the ambulance, attached to a inch operated by the motor. The platform ıay be drawn out and moved close to the body f the horse, which is then rolled over on to it nd easily drawn up into the ambulance by the ower of the motor. A side door at the front f the compartment provides an easy exit for nimals which cannot be backed out. The ides of the compartment are heavily padded, and other conveniences look to the comfort of the horse while on its journey. The accompanying group of illustrations shows the ambulance in operation.



ANIMAL AMBULANCE IN USE IN LOS ANGELES, CAL.

✣ ✣

A New Paint Manual

"Dixon's Silica-Graphite Paint, Its Physical Properties and Especially the Wide Difference Between It and Other Protective Paints," is the title of a new booklet prepared for distribution by the Joseph Dixon Crucible Company, Jersey City, N. J. This booklet, also known as No. 107-1B, contains twenty-four pages of interesting reading on the subject of silica-graphite paint, emphasizing its long-lasting serviceability as a protective paint. Special appeal is made for its use where unusual difficulties exist, and where the preservation of property demands paint of the highest quality.

✣ ✣

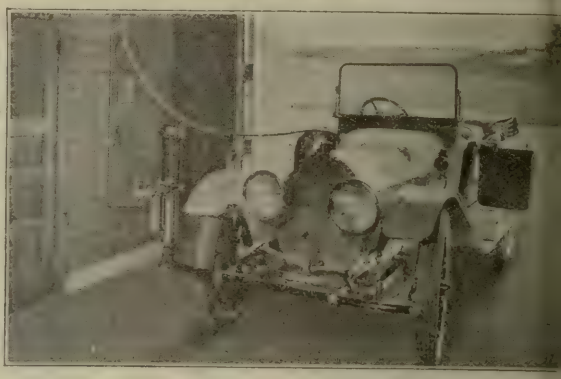
New Sales Managers for Rensselaer Valve Company

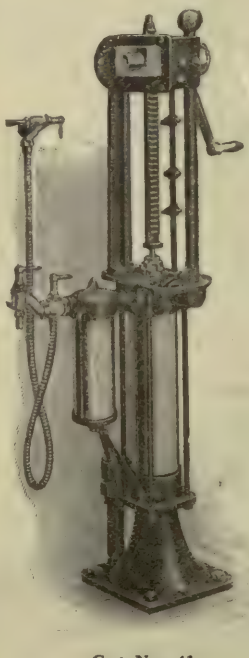
The Rensselaer Valve Company, of Troy, N. Y., announces the following appointments in its sales organization, effective February 1, 1918: Charles L. Brown, sales manager, New England branch; A. E. Jones, sales manager, Chicago branch; George M. Keefer, sales manager, Pittsburgh branch; John S. Warde, Jr., sales manager, New York branch; M. H. Collins, sales manager, Louisville branch.

Asphaltic Concrete Pavements for City Streets and Country Roads

The picture on page 283 shows the well-built railroad station at Morristown, N. J., with its very attractive driveways and parking. The driveways are of Amiesite, and this picture is one of many interesting ones in the booklet entitled "An Ideal Pavement at Low Cost," published by the Amies Road Company, Drake Building, Easton, Pa. Amiesite is an asphaltic concrete for which are claimed the essential features of durability, resistance to destructive traffic and freedom from dust. The process of manufacture consists in treating the stone without heating in order to pro-

The Better Way





Cut No. 41

1 GALLON GASOLINE PUMP FOR INDOOR USE

Countless tests of the most severe character have proven Bowser Gasoline Storage Systems to be the "Better Way" to store and handle this volatile and inflammable liquid.

Gasoline is stored as safely as water. Fire cannot get to it—and in case of fire there is no danger—the Bowser is Fire-Proof.

BOWSER ESTABLISHED 1885

Oil *and* Gasoline Storage Systems

are built for any capacity or requirement. Measure accurately, prevent evaporation and deterioration. Are built of selected materials by expert workmen.

Write for interesting Fire Booklet

S. F. Bowser & Co., Inc. Fort Wayne, Ind., U. S. A.

Sales Offices In All Centers — Representatives Everywhere

ATTRACTIVE RAILROAD STATION, MORRISTOWN, N. J.

e for the adhesion of the asphalt, and of mically treating the asphalt so as to retain adhesive qualities and prolong its life. By se methods the possibility of calcining or ntegrating the stone is avoided, and also possibility of burning the asphalt with hot nes, and the finished pavement is said to be ffected by changes of temperature. Manutured at centrally located, permanent plants, iesite can be distributed in railroad cars by teams. This permits the employment of manent and skilled labor and provides for improvement of methods and of the prod. These are great advantages to the average tractor. The expense of laying the pavent is said to be not more than that of put g down the top course of a macadam road. e booklet contains general specifications for pavement and a table of depths and ghts.

✣ ✣

ghway Industries Association Organd to Promote Road Development

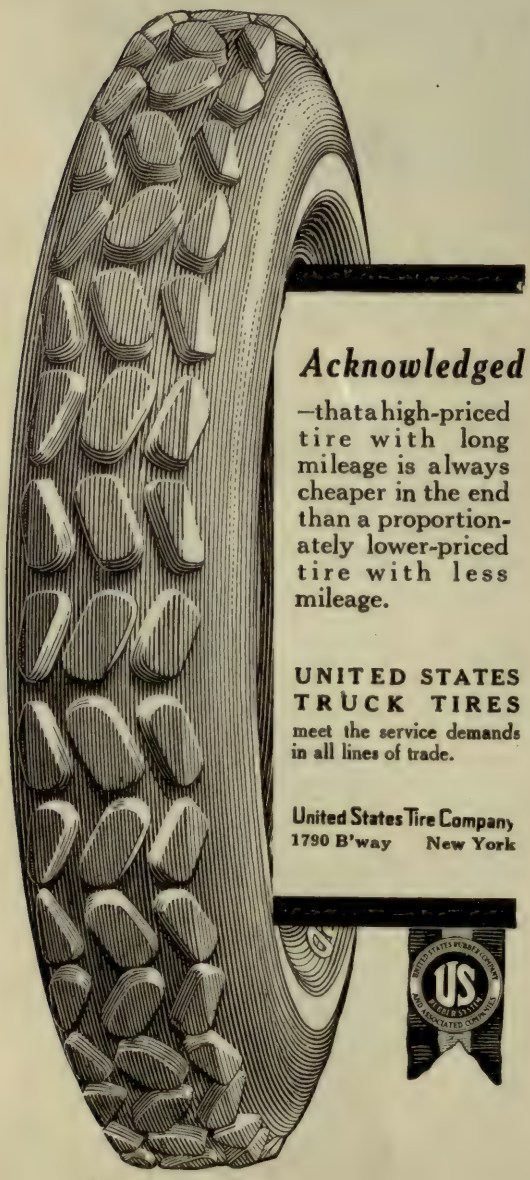
At a meeting of 150 executives of industries, d in Chicago on January 21, the Highway lustries Association was organized. This sociation, which represents over two million ge earners and a capitalization of over two ion dollars, is composed of representatives every industry or interest identified with construction, maintenance and use of highys, such as the manufacturers of cement, ck, slag, stone, sand and gravel, motor cks, tires and road machinery. Its primary pose is to present to the officials at Washton a powerful, united appeal for good ds as a war measure—to impress upon them fact that good highways are absolutely estial to the winning of the war, and to exd to the Government effective coöperation l assistance in the solution of transportation blems by means of improved highways.

The following officers were elected: Presint, S. M. Williams, sales manager, Garford tor Truck Co., Lima, O.; Vice-President, R. Hirst, State Highway Engineer, Madison, Wis., and vice-president American Association of State Highway Officials; Vice-President, S. T. Henry, Allied Machinery Corporation, Cleveland, O., and Vice President Lion Gardner, McGraw-Hill Publishing Co., New York City. The Secretary and Treasurer will be elected by the Board of Directors. This Board comprises the following ten members: A. N. Johnson, of the Portland Cement Association; W. P. Blair, National Paving Brick Association; A. P. Sandles, National Crushed Stone Association; E. G. Sutton, National Association of Sand & Gravel Producers; H. J. Long, National Slag Association; E. J. Morrison, National Association Asphalt Block Manufacturers; S. G. Beatty, National Association Road Machinery Manufacturers; W. O. Rutherford, Motor & Accessory Manufacturing Association; and W. E. Metzger and W. T. White, National Automobile Chamber of Commerce, representing respectively motor car and motor truck interests.

✣ ✣

Ransome-Oshkosh Alliance

The Ransome Concrete Machinery Company, 115 Broadway, New York, has made a combination with the Oshkosh Manufacturing Company, of Oshkosh, Wis. This alliance places the new company—The Ransome Leach Company—in a position to handle the western trade from the Oshkosh factory, and the eastern trade from the Dunellen, N. J., factory, providing a distributing center for machines both in the East and in the West. In addition to the regular line of concrete machinery, the Oshkosh Manufacturing Company is the maker of the Eveready saw rig and woodworking machinery. Duplication of mixers and pavers will be avoided, as well as the duplication of selling agencies. One large warehouse will be established in every principal city where the combined lines will be ready for immediate delivery. Besides the wood-working machinery, a full line of trench pumps, back fillers and material elevators have



Acknowledged

—that a high-priced tire with long mileage is always cheaper in the end than a proportionately lower-priced tire with less mileage.

UNITED STATES TRUCK TIRES meet the service demands in all lines of trade.

United States Tire Company
1790 B'way New York

United States Tires Are Good Tires

Have You Brains

What are they worth to you?

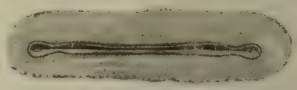
"What is the service worth" is the ba for all values.

SERVICE

is **all** that is bought or sold. This is w two loaves of bread same size are wor more than one. Why a R. R. ticket fr New York to Chicago is worth more th one to Buffalo.

Additional Service

This is why B-Lateral Fire Hose is wor more than DOUBLE that of the old co struction, because Bi-Lateral Hose can flattened without injury to the rubb lining.



Why not buy fire hose constructed right? When in the market write us,

BI-LATERAL FIRE HOSE COMPAN
326 W. Madison Street, Chicago, Ill.

Expert Advice an Service *for* Park Departments!

OWING to the increasing demand for te nical and expert advice in park matters, a the desire on the part of many Boards of P Commissioners and Park Committees to t over the parks to skilled persons to manage, have inaugurated a Park Management Depa ment. We manage your properties, either in tail or act in an advisory capacity. This is a r service by expert and skilled hands. We put business methods into park maintenance development. We will show you how to s money and get increased results.

Write for Detailed Information.

Benjamin E. Gage
30 N. La Salle St. Chicago, I
"AUTHORITY ON PARK MANAGEMEN

n added. The new com-
ed catalog of the Ran-
ie Leach Company will
n the hands of the trade
ost immediately. The ex-
tive offices are located at
hellen, N. J.

✣ ✣

ron Water-Works rating System

he photograph repro-
ed below shows the
on Water-Works aerat-
system. This system
installed by the Spray
ineering Company, 93
deral Street, Boston,
ss. In the foreground
the right is seen the
y cooling pond. The hot
er delivered to the sys-
is cooled by spraying it
a special nozzle which
designed to produce a
ly divided spray at low
ssure. The cooling is ef-
ed by evaporation, radi-
n and convection, the
er falling into an arti-
l or natural pond, suffi-
tly reduced in tempera-
to permit of its being
d over again. By vary-
the pressure, almost
desired capacity may
obtained; the higher the pressure, the more
fect the atomization.

he specific advantages claimed for this
y system are: low initial and maintenance
; economy in power required for opera-
; long life and flexibility. The nozzles
d in the systems have been found effective
removing bacteria, iron and other impuri-
from the water and in liberating included
es. Those installed at Akron are made of
bronze, but they can be supplied in brass, lead, iron or almost any metal alloy which may be required.

ONE OF PHILADELPHIA'S HEAVILY TRAVELED STREETS

Chestnut Street west from Twelfth Street, shown above, is paved with granite blocks between the street railway tracks, with wood block on the shoulders. Both the granite and the wood blocks are laid on a sand-cement cushion and 6 inches of concrete

✣ ✣

Metal Street Signs.

"Calcosigns" for marking streets and roads for advertising purposes and for giving warning are the products of the California Corrugated Culvert Company, of Los Angeles, Cal., and are the subject of an interesting booklet called "Calcosigns for the City Beautiful."

AERATING SYSTEM OF THE WATER-WORKS, AKRON, OHIO

Folk Dance and Game Books For Schools and Playgrounds

The plays, dances and games described in these books furnish wholesome and beneficial exercise as well as pleasure and recreation for growing children.

Bear in mind that the days at school are the "foundation" days. Help the children to lay a good, strong and sturdy one—in mind and body.

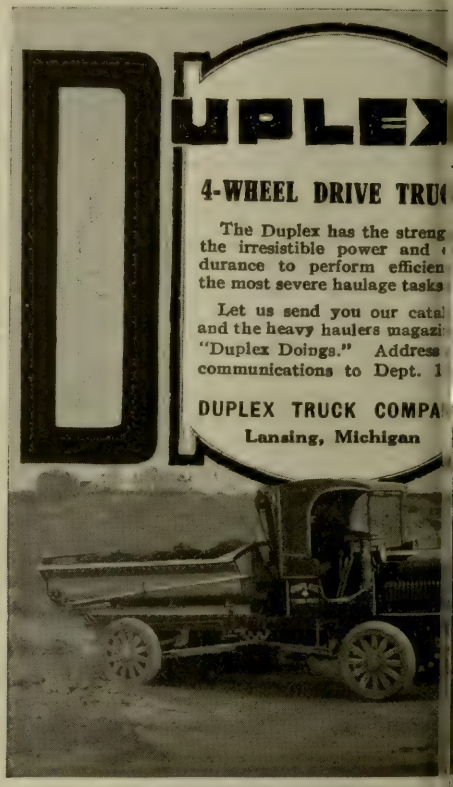
Look over this list of books—any one or all will be sent on approval.

Send for circular giving Table of Contents of each book.

Write now while on your mind.

The Song Play Book. Wollaston and Crampton	$1.80
The Second Folk Dance Book. Crampton	1.80
The Playground Book. Sperling	2.00
More Song Games. Bremmer	1.60
Aesthetic Dancing. Rath	1.60
Dramatic Games and Dances. Crawford	1.80
The Festival Book. Lincoln	1.60
The Folk Dance Book. Crampton	1.80
Swedish Folk Dances. Barguquist	1.60
Fold Dances and Games. Crawford	1.80
Plays and Games for Indoors and Out. Parsons	1.60
Graded Games and Rhythmic Exercises. Newton	1.40
Song Games and Ball Games. Bremner	1.40
Play Songs. Bentley	1.60
Rhythms of Childhood. Crawford	1.80

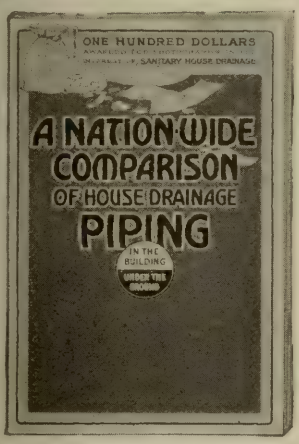
The A. S. Barnes Co. - 381 Fourth Ave. - New York



Nation-Wide Comparison of ouse Drainage Piping

The subject of house drainage is one that is deep concern to all house owners, not alone m the standpoint of economy, but more lly from the standpoint of health and sani- on. And it is axiomatic that proper sanita- n is almost absolutely dependent upon ef- ent piping.

Long experience with piping for all purposes s established the reliability of cast iron in s field. A recent nation-wide photographic test held by the Cast Iron Soil Pipe Makers vertising Association has brought to light ne very interesting evidence to further ad-



nce the cause of cast iron piping for house ainage. This contest, widely advertised thru e trade journals, brought replies from twelve fferent localities. Forty-two pictures were bmitted. The best of these have been incor- rated in a pamphlet issued by the Association titled "A Nation-Wide Comparison of House rainage Piping." A cut of the cover is shown erewith. The prize-winning photographs rm the subjects around which the argu- ents for cast iron soil pipe are woven. On e whole, the pamphlet presents an argument om experience which is worthy of serious ought by those who have met with house rainage difficulties attributable to defective ipe.

✣ ✣

A Distinctive Slide Gate Fire Hydrant

The sectional cut shown on this page pic- ures the Ludlow slide gate fire hydrant, with he gate closed and locked and the drip valve, n the extreme bottom of the hydrant, open. This is one of the products of The Ludlow Valve Manufacturing Company, of Troy, N. Y., which has published a cloth-bound catalog of 98 pages describing its valves and hydrants ommonly used. The company has many spe- ial designs not illustrated in the catalog, and s ready to furnish information, drawings and rices to suit particular requirements. It makes alves of all sizes, for every pressure and for every purpose — water, steam, gas, oil, air and ammonia, and all its valves have ground seats and faces insuring an absolutely tight seating surface. The gate-lock- ing device in the fire hydrant illustrated con- sists of two lock nuts on the stem below the gate, which lock the gate after it is closed and keep it locked, preventing the street from being flooded in case the hydrant bar- rel or the stand-pipe is broken by accident. It also permits the removal of the packing plate and sleeve without shutting off the water from the hydrant. The device op- erates the instant the gate is closed and the drip open, and is released immediately upon start- ing to open the hydrant. The hydrant gives a practically unobstructed flow of water, performs its work satisfactorily under all conditions of soil and weather, and is so arranged that all the working parts can be taken out without doing any digging or disturbing the hydrant barrel. These hydrants are now in use in more than 3,000 different places.

LUDLOW SLIDE GATE FIRE HYDRANT

✣ ✣

Installations of Power Units

The village of Little Valley, N. Y., has re- cently installed a 100 horse-power Bruce-Mac- beth gas engine for light and power service. The plant is now in operation, driving an al- ternating current generator.

A 350 horse-power four-cylinder Bruce-Mac- beth unit has been contracted for by the city of Salamanca, N. Y., to meet its increasing power and light requirements. This is the seventh Bruce-Macbeth engine to be installed in this city, the first having been purchased over ten years ago. The latest unit is ar- ranged so that it can be operated with either gas or coal, in conjunction with which a gas- producer has also been contracted for which will automatically produce gas from coke or coal.

✣ ✣

Studebaker Two-Wheel Trailers

Folder No. 1212, issued by the Studebaker Cor- poration, South Bend, Ind., describes a two-wheel trailer characterized as "just the type of trailer to use for hauling material such as logs, pipe, tele- phone poles, lumber, etc." The trailer is made in two weights, to bear three-ton and five-ton loads, respectively. An interesting feature is the adjustable pole, which is made with five adjust- ments, to suit the length of the material hauled.

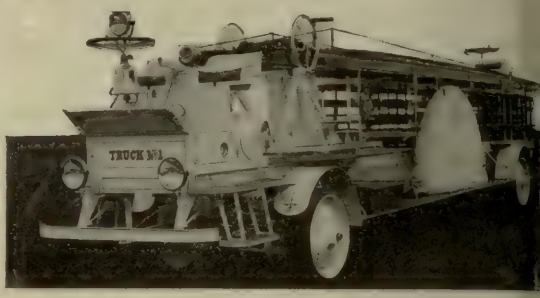
Four-Wheel Drive

Aerial Ladder Truck

Pneumatic Air Hoist
Automatic Ladder Lock

One man puts the ladders where you want them. **No More Cranking.**

Write for free booklet and list of users



COUPLE-GEAR FREIGHT-WHEEL CO., 525 Buchanan Ave., GRAND RAPIDS, MI

Every Town Should Have a Playground—

Yes, every town ought to have at least one playground, or rather "happy-land" as the kids call it. It's a great investment and it pays big dividends, in the shape of healthy, happy youngsters—and these kind are priceless.

Get in touch with us! We'll show you how to plan and equip a model playground—*it's our business.*

Write for free illustrated catalog.

HOWARD GEORGE — ***The Playground Outfitter*** **Philadelphia, Penn**

MUNICIPAL SURVEYS

Twelve years successful results in over one hundred city, county and sta governments in United States and Canada.

Audits	Police and Fire	Refuse Collection and Dis-posal
Charter Drafting	Highways	Waterworks and Other Public Utilities
Budget Systems	Health	Methods of Taxation, Etc.
Accounting	Institutions	
Salary Standardization	Schools	

Write for Literature. Estimates Furnished.

BUREAU OF MUNICIPAL RESEARCH, 261 Broadway, New York Ci

The Anderson Coupling & Fire Supply Company

KANSAS CITY, KANSAS

Manufacturers of

MOTOR FIRE APPARATUS

General Fire Department Supplies

Anderson-Hale Fire Station Door Openers

Estimates Cheerfully Given

Loper Fire Alarm C

STONINGTON, CONN.

Manufacturers of

Compressed Air Fire Whist

Whistle Blowers

Bell Strikers, Boxes, Gon

Etc., Etc.

Estimates Cheerfully Given

ESTABLISHED 1866

BARNUM JAIL CELLS

JAIL WORK of EVERY DESCRIPTION

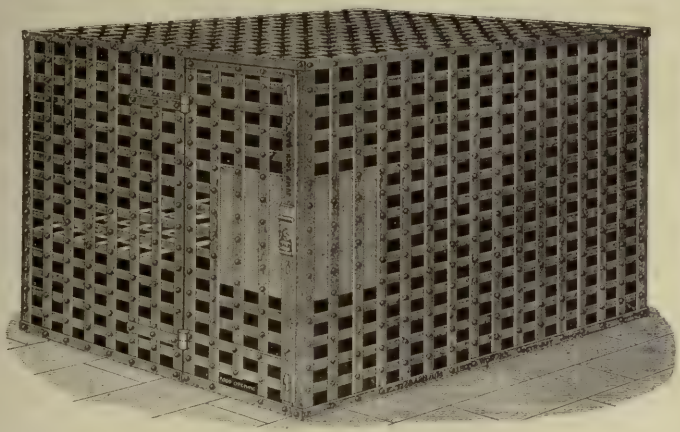
ail Entrance Doors

Steel Lining for Jail Walls

Jail Bedsteads

Steel Window Guards

Iron Stairs



Folding Steel Bunks

Tool-Proof Steel Work

Sanitary Equipment

Locking Devices

Padded Cells

SEND FOR CATALOGUE

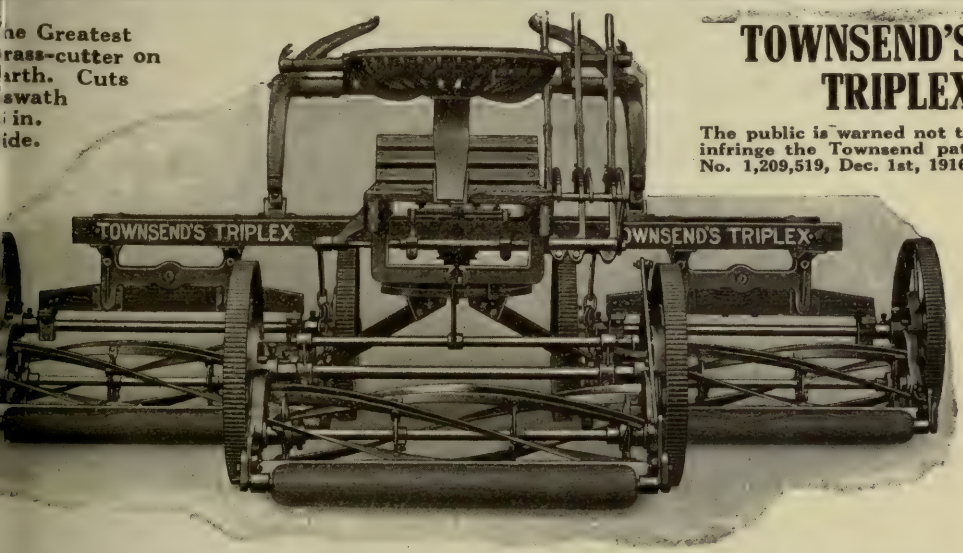
E. T. BARNUM IRON WORKS

DETROIT, MICHIGAN

he Greatest rass-cutter on arth. Cuts swath in. ide.

TOWNSEND'S TRIPLEX

The public is warned not to infringe the Townsend pat. No. 1,209,519, Dec. 1st, 1916.



Drawn by one horse and operated by one man, the RIPLEX MOWER will mow more lawn in a day than e best motor mower ever made, cut it better and at a ction of the cost.

Drawn by one horse and operated by one man, it will ow more lawn in a day than any three other horse-awn mowers with three horses and three men. (We arantee this.)

Floats over the uneven ground as a ship rides the waves. e mower may be climbing a knoll, a second skimming e level, and the third paring a hollow.

Does not smash the grass to earth and plaster it in the mud in springtime, nor crush out its life between hot rollers and hard, hot ground in summer, as does the motor mower.

Write for catalogue illustrating all types of Townsend Lawn Mowers, with list of users (FREE).

S. P. TOWNSEND & COMPANY

23 Central Avenue, Orange, N. J.

Small City Chambers of Commer That Are Making Good

Here are brief facts regarding three organizations whose success been proved by the acid test—the test of time.

Each of them—and many others—acquired their present strength v the assistance of the American City Bureau.

Sharon Chamber of Commerce, Sharon, Pa.

The membership campaign here was conducted two years ago. Since then membership has increased materially. The organization has built up a wonderful re of achievement. This record is presented in a very interesting report just recently iss Ask the Secretary, Mr. T. C. FitzGibbon, to send you a copy, for it is well worth read

Batavia Chamber of Commerce, Batavia, N. Y.

The campaign the Bureau directed here was completed in February, 1917. T facts are significant indications of the organization's present condition:

1. Collections have been better than 90%.
2. Thirty new members have been added during the past two months.
3. There have been fifty active **special** committees during the past year.

If you would like to learn more about this Chamber's success, ask anyone you k who lives in Batavia.

Butler Chamber of Commerce, Butler, Pa.

The membership of this organization, too, has increased since the conclusio the campaign over a year and a half ago.

A splendid Community House has been established which provides headquar for every civic organization in the city and for the Red Cross and Farm Bureau. I also used as a meeting place by a number of societies and lodges. This is only one of m worth-while achievements that have been accomplished here. The Butler Chambe Commerce is a thoroughly demonstrated success.

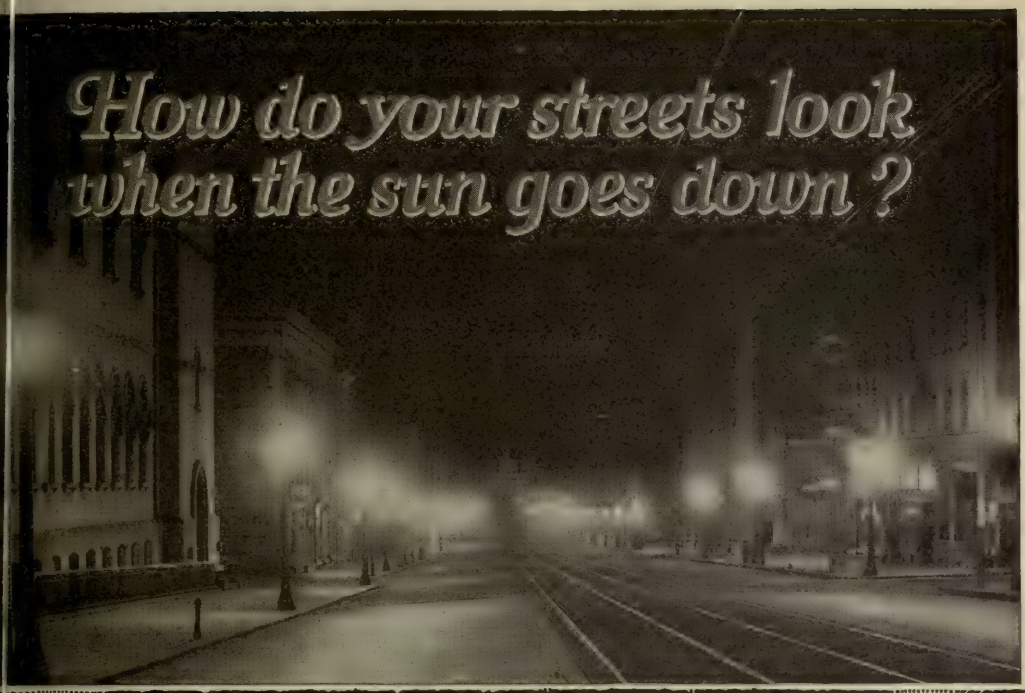
Our service to these organizations has not ended. As an illustrati just a few weeks ago the Secretary of the Bureau visited each of them a made recommendations based on a careful analysis of the conditions e was facing. Visits of this sort will be made from time to time through the three years following the campaign.

These organizations have also had the continual cooperation of Bureau's Information Depatrment.

This is the sort of service that builds a lasting foundation for Cham of Commerce achievement.

AMERICAN CITY BUREAU

TRIBUNE BUILDING **NEW YORK CI**



Street-ology

Do they sparkle with white light?

Do they draw people from far and near to go "window shopping?"

Are they an inducement to live and do business in your city?

Do they increase the value of your real estate?

Do they advertise the city?

Do they discourage crime and rowdyism? Do they safeguard traffic and pedestrians?

Are they a credit to your city administration?

Are they a shining example of what a good lighting company can do for a city? Do they cause you to hold up your head in honest pride?

If you live in a G-E Lighted Town, you can give an emphatic "YES" to every question.

If you can't say "yes"–ask the nearest G-E Street Lighting Engineers to help you make those dark highways into bright "*White Ways.*"

GENERAL ELECTRIC COMPANY

SCHENECTADY, N. Y.

Sales Offices in Principal Cities

7328

PLANNING A PLAYGROUND

The problem with which you are confronted in planning your new playgrounds hav probably been worked out over and over again by us, and our Engineering Department is equip ped to solve any problem which may present entirely new features of construction.

Our service in planning your equipment incurs no expense or obligation. It reflects ou 43 years practical experience. We know playground needs thoroughly. We have literall grown up with the playground movement.

WRITE FOR CATALOG "W". It is a recognized guide on Playground Equipment. covers every form of apparatus that has been approved in actual practice.

FRED MEDART MFG. CO. St. Louis, Mo

Gymnasium Outfitters—Steel Lockers

ALL MUNICIPALITIES NEED PLAYGROUND

The Playgroun not only bette the physical an moral tone of city, but it is a rea live investmen It cuts the pe petual movin population to minimum whic saves your manu facturer and you merchant.

American Appa ratus will produc results.

WRITE FOR OUR CATALOGUE TO-DAY

AMERICAN PLAYGROUND DEVICE CO., W. 25th St., Anderson, Ind

Everything for the Playground

PROGRESSIVE CITIES USE

THE FUN FUL LINE
PLAYGROUND EQUIPMENT

Write for free Booklet

HILL-STANDARD CO.

216 Fun-Ful Ave., Anderson, Ind.

ll Steel Playground Apparatus

THE EUREKA STUDEBAKER PARK COMBINATION

THE EUREKA LINE
THE CHILDRENS FAVORITE

Swings, Giant Strides, Flying and Traveling Rings, Teeter Boards and Ladders, Aluminum and Maple Slides, Park Settees and Lawn Swings, Merry-Go-Rounds, Horizontal Ladders and Combinations.

Cat. No. 16 Full Outfits And Fittings Only

The Ashland Mfg. Company
Dept. 14 Ashland, Ohio

To so form the life of our youth that they need never be reformed is indeed a great achievement

ureka quipment Utility nexcelled Renowned Rectitude Efficient Economical Kiddies Kind All-Steel Apparatus

Cemcoat

The Enamel-like Wall Coating

Cemcoat is furnished in either Gloss or Flat.
Cemcoat has the combined virtues of enamel and paint.
It presents a tile-like finish.
It is washable, sanitary and durable.
Cemcoat should be used for all municipal buildings such as Schools, Bath Houses, Police Stations, Jails, etc.
Particularly adapted for safety lines on pavements.

Write for literature, color card, testimonials, etc.

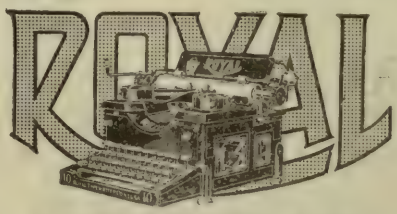
Department 27

L. SONNEBORN SONS, Inc.
264 Pearl Street, New York

RAPID FIRE

Business to-day is a rapid-fire proposition.

We've got to have people and machines that are capable of the very highest efficiency.



Royal Master Model No. 10—$100.

The Royal Typewriter is built with this fact in mind.

It is built for the rapid-fire, strenuous business of the time.

When you buy a ROYAL, you get a typewriter which is built on the understanding that you expect to keep it in service for many years.

ROYAL TYPEWRITER COMPANY
INCORPORATED
Royal Typewriter Bldg., 364-369 Broadway New York
Branches and Agencies the World Over

THE GAMEWELL FIRE AI TELEGRAPH CO.

"Registered U. S. Patent Office"

Manufacturers of Fire Alarm and Police Signal TELEGRAPHS for Municipalities and Private Parties

The Gamewell system of to-d the outcome of the combined inve genius and mechanical skill of r whose valuable services the com has been able to secure during past fifty-seven years, in pursuan its policy of meeting at any cos requirements of the varied condi existing in different localities.

Correspondence Solicited.

General Office and Works:
Newton Upper Falls, M

LAPIDOLITH
TRADE MARK

For All Concrete Floors

The concrete floors in your water-works, fire-houses, filtration plants, pump stations, etc. need Lapidolith to make them hard as granite—dustproof, waterproof and resistant to the action of mostc hemicals. Lapidolith should be used on all concrete floors, old or new. Results are guaranteed.

Used by leading industrial plants in every line in every city.

Write for literature, testimonials and free samples.

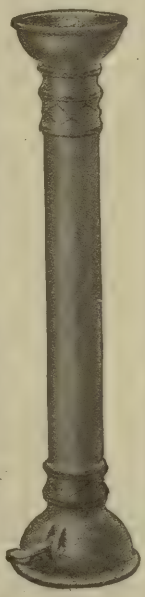
Department 27

L. SONNEBORN SONS, Inc.
264 Pearl Street, New York

INEXPENSIVE
RINKING FOUNTAINS

)ur bubbling fountains, : practical kind, are just : kind to be installed on ır streets and boule-rds, in your parks and ıares and public play-ɔunds. The expense for tallation is very small is the upkeep cost.

Ve are specialists on fountains drinking purposes. Place your uirements in our hands. Write our catalogue showing our ny designs.



UNDLE-SPENCE MFG. CO.
ilwaukee, Wis.

FOUNTAINS
DISPLAY and DRINKING
LAMP STANDARDS
OVER ONE THOUSAND PATTERNS
THE CASEY HEDGES CO.
CHATTANOOGA, TENN.
Chicago Cincinnati

Two New Books That You Will Want On Your Desk

A NEW MUNICIPAL PROGRAM

Edited by Clinton Rogers Woodruff

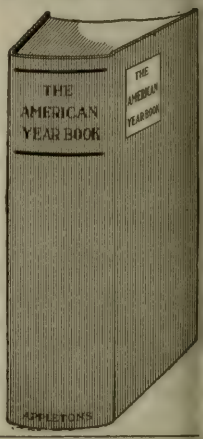
The latest thought on civic government
By the best thinkers of the day
Each chapter written by an expert

This book offers a complete and practical program of municipal reform as it has been found efficient in various cities of the United States. Each phase of city government is taken up in a separate chapter, written by a man who has devoted years to the study and investigation of his special problem. The book takes up in detail the model city charter, administrative organization, city planning, the franchise policy, etc. Among the contributors are such prominent men as Abbott Lawrence Lowell, President of Harvard University, and William Bennett Munro, Professor of Municipal Government at Harvard.

National Municipal League Series. 12mo. Cloth. $2.00 net.

THE AMERICAN YEAR BOOK

Edited by Francis G. Wickware



A complete compendium of American life for the year 1917. This volume covers every field of American activity, political, scientific, artistic and social. There are thirty-one sections, each with hundreds of articles written by a special expert. Such timely matters as war surgery, the Liberty Loan, camouflage, and the activities of the Red Cross are thoroughly dealt with. Every word of the material is authoritative. And the book is completely indexed for ready reference.

8vo. Cloth. $3.00 net.

The National Municipal League Series—The Best Books on Civic Government

Write for our complete list of books covering every phase of civic affairs. Each volume is the authority of its field.

35 W. 32 St. **D. APPLETON & CO., PUBLISHERS,** New York

These Are Appleton Books

FIBREX TREE WIRE

FIBREX TREE WIRE is a rubber insulated, copper conductor, protected by a serving of tarred jute, one non-metallic tape and a weatherproof braid such as is applied to Simplex Wires and Cables for out-door service. The total thickness of this protection is about 5-32″.

FIBREX TREE WIRE is distinguished by a treated fibrous tape which is exceedingly tough and resists wear far better than any non-metallic protection previously applied to tree wires. This tape is applied in the same manner as steel tape and does not interfere with the flexibility of the insulated wire. It has the advantages of steel tape without its disadvantages.

FIBREX TREE WIRE is absolutely non-inductive. It is not a menace to workmen on or near the lines, because the fibrous tape can carry no dynamic or static charge.

FIBREX TREE WIRE will often save the expense of tree trimming. Tree insulators or battens are unnecessary.

FIBREX TREE WIRE is less expensive than some of the protective devices ordinarily used. It can be jointed to the line wire easily and safely.

FIBREX TREE WIRE is weatherproof. Regardless of weather conditions, grounds do not occur with their consequent dangers. There is no leakage over the fibrous tape and a uniform line voltage is preserved.

FIBREX TREE WIRE is made for all commercial voltages.

Ask for Sample and Prices.

SIMPLEX WIRE & CABLE Co

MANUFACTURERS

201 DEVONSHIRE ST. BOSTON

CHICAGO SAN FRANCISCO

SANITATION

While our "CANCO" garbage can in point of appearance and strength of construction is without a peer, yet our equipment—the most comprehensive in the country—is such that we can make any desired sort of garbage container.

TRADE CANCO MARK

AMERICAN CAN COMPANY

NEW YORK

Chicago Toledo San Francisco

With Offices in All Large Cities

REFUSE GOES INTO THE CAN— NOT INTO THE STREET

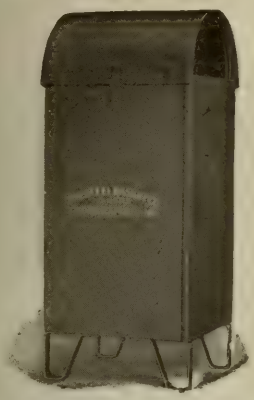
Why doesn't your city place Rochester cans on the street corners, in the parks and in all other convenient places. Rochester cans do away with unsightly littered streets. All rubbish goes into the cans — not into the gutters.

Made of the best materials and in many styles. Made by the makers of the famous "Iron Horse Brand" ash, garbage, street and trash cans.

Reasonable prices. Immediate shipments.

Send for illustrated catalog.

ROCHESTER CAN CO.
ROCHESTER, N. Y.



A STREET CAN

nvenient for hurried City people. The ood cover hides the contents from passers- —the open ends allow papers, etc., to be sily and quickly deposited.

This Can may be used with sacks hung in- le. Is made in set up or knock down shape

For complete description, ask

HE STEEL BASKET COMPANY
8 So. Third St., Cedar Rapids, Iowa

"The Spring's the Thing"
SHAWNEE MOWER CO., 5 Beekman St, N. Y.

AMERICAN-GROWN TREES

OUR stocks of trees, shrubs and plants are not curtailed by the stoppage of foreign shipments. We sell Andorra-grown.

Catalog on request.

ANDORRA NURSERIES
Wm. Warner Harper, Prop.
Box 20, Chestnut Hill, Phila., Penna.

Shade Delivered With The Trees

3 to 5 years or more according to size saved over small saplings. We take the risk during their early tender life and you get the benefit.

We guarantee good trees of substantial growth and will replace any one that fails to thrive. We could not afford to make this offer if we did not know the good roots of trees that we furnish.

The value and benefit of good healthy shade trees in streets, parks, etc., as shown in the picture below are greatly appreciated and considered one of the most important municipal improvements.

Don't leave your streets barr and uninviting like the abov With a small outlay of mon make your city attractive and desirable place to live in.

Write today for literature on t subject.

Remember Hick's Trees a tall, straight and bushy and o 65 years in the business is a gua antee of quality.

HICKS NURSERIE

Westbury Long Islan

Did You Read Page 34?

Turn To It Now.

Butler Refuse Cans

are neat cans

The collected refuse in Butler Cans doesn't show up before your eyes.

It is covered from view (see illustration). These cans are shipped "knock-down" thus saving big freight bills. Write for particulars.

The Butler Mfg. Co.
St. Anthony Falls Sta.
Minneapolis, Minn.

Also makers of "Rus-Pruf" corrugated culverts with B.M.C. Wings

STEWART IRON FENCE

"The Standard of the World"

beautifies and protects public pro economically, permanently, satisfact The fencing of reservoirs at Chattanooga, Fort Thomas, Ky., Butte, Mont., and pu stations at New York City and Seattle, Wash typical Stewart installations.
Stewart's Iron Fence and Gates for hospitals, s parks, playgrounds and public buildings. for big illustrated catalog.

THE STEWART IRON WORKS
(Incorporated)
527 Stewart Block Cincinna

Directory of Nurseries and Seedsmen

Thorburn's

1917 Catalog

A very large volume of Thorburn Seeds
e furnished for parks and cemeteries.

Write us for catalog and let us know your
quirements: and your letter will have our
rompt and careful attention.

J. M. Thorburn & Co.
3 Barclay Street NEW YORK

MEEHAN

Nursery Stock

Needs no recommendation. It is known throughout the American Continent

225 acres

ORNAMENTAL TREES, SHRUBS, EVERGREENS and HARDY PLANTS

Spring catalog now ready

THOMAS B. MEEHAN CO.
Wholesale Nurseryman
DRESHER (Near Philadelphia) PA.

Burpee's Seeds Grow

URPEE'S ANNUAL for 1918, the Leading American Seed Catalog contains the latest and most reliable formation about "The Best Seeds that Grow." 216 pages with 103 colored illustrations. It is sent ee to those who write for it. Write for your copy today. A post card will do.

V. ATLEE BURPEE & CO. Seed Growers PHILADELPHIA

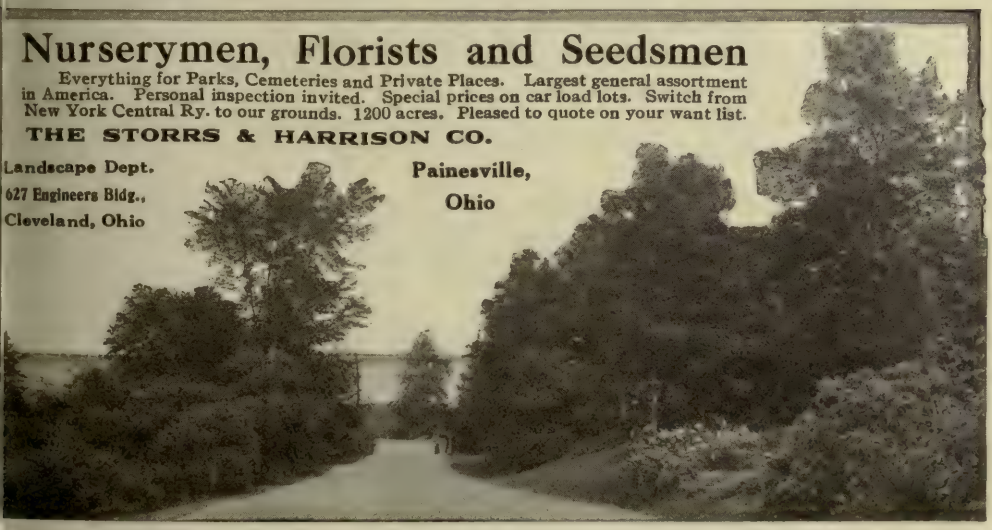
Nurserymen, Florists and Seedsmen

Everything for Parks, Cemeteries and Private Places. Largest general assortment in America. Personal inspection invited. Special prices on car load lots. Switch from New York Central Ry. to our grounds. 1200 acres. Pleased to quote on your want list.

THE STORRS & HARRISON CO.

Landscape Dept.
627 Engineers Bldg.,
Cleveland, Ohio

Painesville,
Ohio



NORWAY MAPLES

The best shade tree for street and park purposes — especially in northern latitudes and in smoky and dusty localities —. is the Norway Maple.

Norway Maples such as the one depicted transplant with the minimum of setback and give immediate effect. We have several thousand trees just as good as this one. Many are better.

All are sound, healthy trees with straight, smooth, sturdy trunks, heavy masses of fibrous roots, and well-developed, bushy heads. They run 14 to 16 feet tall and in two calipers — 2 to 2½ inches and 2½ to 3 inches.

Trees of this size pack about 500 to 700 to the carload. Write us for prices on the quantity you can use. Special prices on carload lots.

We also grow a general line of trees, shrubs and evergreens for street and park planting.

Framingham Nurseries
FRAMINGHAM — MASSACHUSETTS

Willadean Nurseries

Offer a very complete line of Trees, Shrubs and Ornamental stock for all kinds of Landscape work. Send your want lists for estimate. Trade list on application.

THE DONALDSON CO.
Box 22, SPARTA, KY.

TREES SHRUB EVERGREENS
800 ACRES

AMERICAN NURSERY CO.
Singer Building, New York
NURSERIES
Springfield, N. J. Flushing, L

BOBBINK & ATKINS

World's Choicest Nursery and Greenhouse Products

We invite interested parties to visit our Nursery and inspect our Trees, Shrubs, Evergreens, Herbaceous Plants, Roses and other stock of which we have more than 300 acres.

OUR ILLUSTRATED GENERAL CATALOG No. 22 describes the high class Nursery materi we grow.

SPECIAL PRICES quoted on lists for Public Parks.

Nurserymen, Florists and Planters, Rutherford, New Jerse

W. & T. SMITH COMPANY

NURSERY STOCK AT WHOLESALE

Send for Catalogue and Price List

GENEVA NURSERY, Geneva, N. Y.

Lewis & Valentine Co.
Roslyn, N. Y.
The World's Largest Movers of Big Trees.

Ornamental Trees, Shrubs, and Hardy Perennials

A complete stock.
Quality unexcelled.
Send for price list.

HENRY KOHANKIE & SON
Painesville, Ohio

Norway Maples

unrivalled for shade and for landpe effects. We have a large stock plendid specimens that will mature idly into towering round-topped es, with clean, sturdy trunks. Also complete stock of ornamentals. er 2500 acres in nursery stock.
rite for 1918 Catalog and prices.

arrisons' Nurseries, BOX 70, **Berlin, Md.**

A BOOK YOU OUGHT TO HAVE

Shade Trees in Towns and Cities

287 Pages — 251 illustrations — Price $3.00

The selection, planting and care of shade trees as applied to the art of street decoration; their diseases and remedies; their municipal control and supervision.

THE CIVIC PRESS, 87 Nassau St., N. Y. City

OR *SAFE* TREE SURGERY—

for Tree Surgery that is scientifically accurate and mechanically perfect—for Tree Surgery that saves trees without guessing and experimenting—come to headquarters.

The Davey Tree Expert Co., Elm St., Kent, Ohio

Branch offices with telephone connections: 225 Fifth Ave., New York. 2017 Land Title Bldg., Philadelphia. 450 McCormick Bldg., Chicago.

Permanent representatives in all principal cities.

Davey Tree Surgeons

ENTERPRISE PROTECTIVE FENCE

protects and beautifies

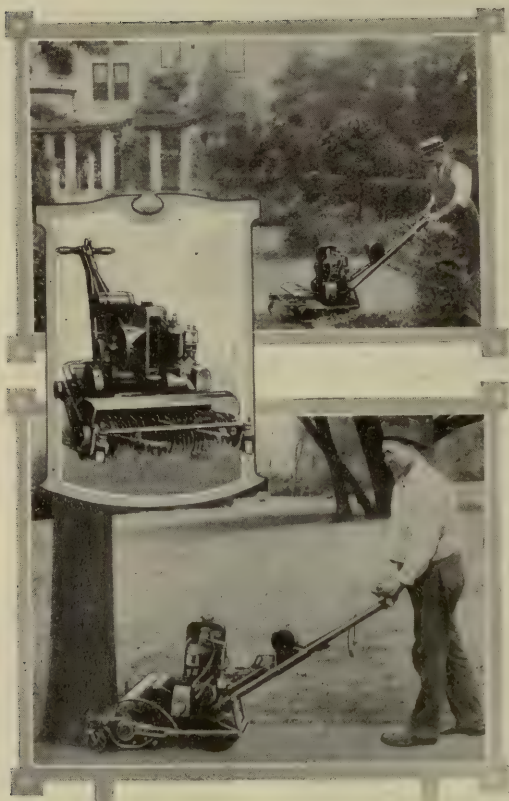
s out undesirable persons. Beau- surroundings and increases es. Does not obstruct fine views.

Schools, Hospitals, Parks, Estates, Public Bldgs., Cemeteries, Asylums, Etc., Etc.

Send for Illustrated Catalog explaining offer to make free blue-print of Enterprise fencing for any property.

TERPRISE IRON WORKS 1161 E. 24th St., Indianapolis

Specialists for 33 years in All-Iron and Iron-and-Woven-Wire protective fencing



Lawn Beauty with Economy and Conservation of Labor

Under ordinary conditions, hand mowing is inefficient and expensive. This year, with labor at a premium and almost impossible to obtain, hand mowing is prohibitive.
The solution to the lawn cutting problem is the

FULLER & JOHNSON
MOTOR LAWN MOWER

The Fuller & Johnson Mower combines the convenience of a hand mower with large cutting capacity. In one day's time one man can cut five acres of lawn with the Fuller & Johnson. He can cut it so perfectly that no after-trimming around trees, shrubs or driveways will be necessary. He can cut it when needed instead of waiting, as with a horse mower, until the turf is solid so that the lawn won't be marred by the horse's hoofs.
This is what the Superintendent of the Park District of Oak Park, Ill., has to say about the Fuller & Johnson:

> "Replying to your inquiry of July 5th, we are glad to say that the Fuller & Johnson Motor Lawn Mower which we purchased from you a few months ago has been in constant use, has required very little repairs and has been in every way very satisfactory, so much so that were we in the market for another machine of this type, I am sure we would not hesitate to purchase another of this kind."

All over the country, in parks, cemeteries and on large estates, Fuller & Johnson Motor Lawn Mowers are fast replacing hand mowers, horse mowers and the heavier types of motor mowers. Where you find the most beautifully kept lawns there too you will find the Fuller & Johnson Mowers, for good business judgment as well as lawn beauty dictate their use. Let us send you complete details about the Fuller & Johnson. Write for a copy of our new book entitled "A Better Lawn."

MANUFACTURERS DISTRIBUTING CO.
471 Fullerton Building St. Louis, Mo.

DREER'S GRASS SEEDS

¶ You sow a seed that is full of life and vigor when you sow

DREER'S GRASS SEED

¶ Special brands for every purpose—sunny or shady places, lawns, terraces; for city, park and seashore use. All brands composed of choicest, re-cleaned seed, carefully blended, and tested for germination.

¶ Write for prices or any desired information on lawn making. Special Grass Seed Circular—free.

DREER'S GARDEN BOOK FOR 1918 contains much information helpful to those interested in civic improvements which include flowers, shrubbery, etc. Sent free to anyone mentioning this publication.

HENRY A. DREER
714-716 Chestnut St. Philadelphia

Storm Insurance

ORANGEBURG *Fibre Conduit* will sa guard many thousands of Central Stati Telegraph, Telephone, Signal and other wi against the storms of the coming winter.

Will it safeguard *yours?* If not, *why* not

Let us figure with you on the proposition protecting *your* wires with ORANGEBU *Fibre Conduit* "storm insurance." *Get BOOK*

THE FIBRE CONDUIT COMPAN
ORANGEBURGH, N. Y.
New York Boston Chicago San Franci

A SWING FOR PLAYGROUNDS

made strong and durable with heavy steel springs which makes swinging a pleasure as well as exercise for the children. Write for booklet.

NOLL BROTHERS
Benches and Swings
BAUSMAN, PA.

DIRECTORY OF CONSULTING ENGINEERS CONTRACTORS LANDSCAPE ARCHITECTS

xpert vice is Real onomy

Effective Construction Requires Wise Planning

right & Mebus
CIVIL ENGINEERS
planning and municipal improve- parks, drainage, sewerage and disposal.
LAND TITLE BUILDING
PHILADELPHIA

KANSAS CITY, MO. Interstate Bldg.
Burns & McDonnell
CONSULTING ENGINEERS
Appraisals, Rate Investigations, Expert Testimony, Water Works, Sewerage, Lighting.
Clinton S. Burns R. E. McDonnell

F. A. Dunham-Clarin Co.
CIVIL ENGINEERS
Municipal Engineering
Roads Sewers Supervision
Surveys
Topographic Title
Land Subdivisions
109 Park Ave. Tel. 610
PLAINFIELD, N. J.

ALLENTOWN
ING LABORATORY
cting and Testing Engineers and Chemists.
nt and Aggregates, Steel, Paving Materials, Water Analyses
T B. McCREADY, Director
-77 Linden St., Allentown, Pa.

JAMES M. CAIRD
Assoc. Am. Soc. C. E.
CHEMIST and BACTERIOLOGIST
OFFICE AND LABORATORY
271 RIVER STREET TROY, N. Y.
Water Analysis and Tests of Filter Plants

Analyses Tests Inspections
Consultations Reports Specifications
WALTER H. FLOOD
Chemical Engineer
PAVING AND ENGINEERING MATERIALS
Municipal Work a Specialty
326 River Street, CHICAGO

W. Alvord
d Chas. B. Burdick
SULTING ENGINEERS
ts, Investigations, Plans and ations for Water Supplies, Purification, Water Power, e, Sewage Disposal.
ORD BLDG. CHICAGO

CHESTER & FLEMING
HYDRAULIC AND SANITARY ENGINEERS
Water Works, Water Filtration, Appraisements and Reports, Sewerage, Sewage Disposal, Operation of Properties.
UNION BANK BLDG. Pittsburgh

Fuller & McClintock
CONSULTING HYDRAULIC ENGINEERS and SANITARY EXPERTS
170 Broadway, New York City
George W. Fuller James R. McClintock
Jesse K. Giesey

FIELD A. ARNOLD
andscape Architect
Land Subdivisions
arks Institution Grounds
Private Estates
nfield St. Boston, Mass.

LOUIS S. COLE
LANDSCAPE ARCHITECT
14 E. Jackson Blvd.
CHICAGO, ILL.
Specialist in City Planning, Playgrounds, Parks and Cemeteries.

Gannett, Seelye & Fleming
CONSULTING ENGINEERS
Civil, Hydraulic, Sanitary, Electrical, Municipal Problems
204 LOCUST ST., HARRISBURG, PA.

OLD & TRIPP
andscape Architects
anning, Land Subdivisions, arks, Institution Grounds, Private Estates
an Bldg., Cleveland, Ohio

J. R. CRAVATH
Consulting Engineer
140 S. Dearborn St., Chicago
Street lighting.
Public utility rates and valuations.
Supervision of operation of electric plants.

SAMUEL A. GREELEY
64 W. Randolph St., Chicago
Hydraulic and Sanitary Engineer
Sewerage, Sewage Disposal, Water Supply and Filtration, Garbage and Refuse Disposal, Treatment of Industrial Waste, Supervision of Operation.

City, Mo. Interstate Bldg.
CK & VEATCH
Consulting Engineers
, Sewage Disposal, Water Sup- er Purification, Electric Lighting, ants, Valuations, Special Investi- nd Reports.

WILLIAM E. CULLEN
Landscape Architect and Designer
Ornamental Gardening, Beautifying Homes, Rural Districts, Towns, Schools, Yards, Parks and Cemeteries.
BOULDER, COLORADO

JOHN H. GREGORY
Consulting Hydraulic Engineer and Sanitary Expert
170 Broadway, New York City
Reports, Investigations, Plans and Specifications for Sewerage, Sewage Disposal, Water Supply, Water Purification and Garbage and Refuse Disposal.

L. BLANCHARD
Soc. C. E. M. Can. Soc. C. E.
SULTING HIGHWAY ENGINEER
DWAY and 117th STREET
NEW YORK CITY

The Duluth Engineering Co.
W. B. PATTON, Mem. Am. Soc. C. E., Ex-City Engineer Duluth, Manager
MUNICIPAL ENGINEERS
Waterworks, Sewerage, Electric Lighting, Town Planning.
Suite 612-616 Palladio Building
DULUTH, MINN.

New York City 2 Rector Street
A. E. HANSEN
Hydraulic & Sanitary Engineer
Design & Supervision of Construction
Sewerage Water Works
Sewage Disposal Water Purification
Drainage Water Works Valuation
Garbage Disposal Water Analyses

James C. Harding,
Consulting Engineer and Sanitary Expert.
Water Supply and Purification. Refuse Disposal. Sewerage and Sewage Disposal. Investigations of Epidemics. Water Works Valuations. Supervision of Construction and Operation.
New York City, 170 Broadway

MUNICIPAL PROBLEMS
Budget Making—Salary Standardisation—Centralized Purchasing—Cost Accounting—Public Utility Service and Rate Studies
J. L. JACOBS & COMPANY
Engineers—Cost Accountants—Municipal Experts
Monadnock Building Chicago

THOMAS MEEHAN & S
Practical Landscape Garden and Engineers
Especially qualified for work involvi of hardy plants. Large estate de ments: country clubs. Plans execu "*We know plants*"
6703 Chew Street, Germantown, Phil

Sid. J. Hare Fellow A.S.L.A. **S. Herbert Hare** Member A.S.L.A.
HARE & HARE
Landscape Architects
604 Gumbel Bld., Kansas City, Mo.
Plans and Reports for Parks, Park Systems, Land Subdivisions, Estates, Municipal Improvements, Cemeteries

The
JENNINGS-LAWRENCE CO.
CIVIL AND MUNICIPAL ENGINEERS
511-12 Hartman Bldg.
COLUMBUS OHIO

HUGH C. MITCHEL
GEODETIC ENGINEER
CONSULTANT ON CITY TRIANGUL PRECISE LEVELS, AND TOPOGR SURVEYS.
601 West 32d Street
AUSTIN, TEXAS

HAZEN, WHIPPLE & FULLER
CONSULTING HYDRAULIC and SANITARY ENGINEERS
WATER SUPPLY and SEWERAGE
Allen Hazen, W. E. Fuller, C. M. Everett, G. C. Whipple, F. F. Longley, L. N. Babbitt, H. Malcolm Pirnie
30 East 42d St. NEW YORK CITY

GEORGE A. JOHNSON
M. Am. Soc. C.E.
Consulting Hydraulic Engineer and Sanitary Expert
150 Nassau St., New York.
Water Supply and Purification. Sewerage and Sewage Disposal. Plans and Reports. Supervision of Construction. Valuations. Improved Operation of Existing Plants. Investigation of Epidemics.

FRANK H. NUTTE
Landscape Architect and Engin
710 Sykes Block, Minneapolis,
Advice, Sketches, Designs or full ing Plans for Parks, Cemeteries, or Home Grounds. Surveys m desired. Correspondence Solicite
City Park Engineer from 1883 to

Arthur H. Helder
Landscape Architect
418 Reliance Bldg. Kansas City, Mo.

H. C. KITTREDGE
Consulting Hydraulic and Sanitary Engineer
ROCHESTER, N.Y.

POLLOCK AND TAE
CONSULTING ENGINEE
Pavements, Highways, Water S Drainage, Sewerage and Sewage D
Designs, Specifications and Super
CLARENCE D. POLLOCK, GEORGE A. TABER — Memb Am. Soc
Park Row Building, New Yorl

Rudolph Hering, D.Sc.
Consulting Engineer
170 Broadway New York
WATER SUPPLY, SEWAGE AND REFUSE DISPOSAL
Over 40 years active practice in United States and Canada

A. Elliott Kimberly
SANITARY ENGINEER
Water Supply, Water Purification, Sewerage, Sewage Treatment, Industrial Waste Disposal
8 East Long St. COLUMBUS, OHIO

Alexander Potter, C
Hydraulics, Sanitation, crete Structures Design Executed.
50 Church Street, New
(Hudson Terminal) Tel., Cortlan

J. Wallace Higgins
Assoc. M. Am. Soc. C. E.
CIVIL AND LANDSCAPE ENGINEER
Municipal Engineering, Sewerage, Parks, Cemeteries, Subdivisions, Topographic Surveys, Title Surveys, Estimates, Supervision
52 Vanderbilt Avenue, New York

MORRIS KNOWLES
Consulting, Sanitary and Hydraulic Engineer
Municipal, Community and Civic Problems
Pittsburgh, Penna.

Clyde Potts
30 CHURCH ST. NEW
Civil and Sanitary Engin
Sewerage and Sewage Disposal Hydraulics, Water Works, Pl Reports, Plans and Estimates.

Charles C. Hopkins
M. Am. Soc. C. E.
Consulting Hydraulic and Sanitary Engineer
349 Cutler Bldg., Rochester, N.Y.
Water supply and purification. Sewerage. Sewage and wastes disposal. Municipal engineering. Plans, reports, estimates, supervision. Expert testimony and appraisals.

CHARLES W. LEAVITT
CITY PLANNING
and all branches of
CIVIL and LANDSCAPE ENGINEERING
220 Broadway NEW YORK

LOUIS E. STAN
Certified Public Accoun
Municipal and Public Utility Ac Rate and Capitalization C
200 Fifth Avenue, New
Chief Acct.—Bd. of Ed. 1899
Acct—Pub. Service Com. 190
Chief Auditor—Dept. Water Sup and Electricity, 1912-1916

LANDSCAPE DESIGN
Development of Parks, Cemeteries and Institution Grounds
Private Estates and Sub-divisions
M. H. HORVATH
Landscape Architect & Consulting Forester
649 Leader-News Building
Cleveland, Ohio

J. L. LUDLOW
Winston-Salem, N. C.
Consulting Municipal Engineer Sanitary and C ic Expert
Water Supplies, Sewage Disposal, Reports, Plans, Valuations, Appraisals. Efficiency and Economy Studies, Physical and Financial Reports on Public Utilities in Southern Cities. Advice in Municipal Sanitation and Public Health. Interviews by appointment in Eastern Cities.

Sewage Disposal P
for Country Residences, Factories tutions. Standard Plans and Spe including description and estimate of modern sewage treatment.
Blue Prints, 12 sheets, 9" x 12",
LeRoy K. Sherman, Sanitary
1102 Tacoma Bldg., Chica

TOR A. RIGAUMONT
CITY PLANNER
son Bldg., Pittsburgh, Penna.
tation — Housing — Thoroughfares
ICIPAL PREPAREDNESS
A PRACTICABLE
PREHENSIVE CITY PLAN
WHEN PRICES DECLINE
Correspondence Solicited

UTILITIES ENGINEERING CO.
S. Morsell F. C. Van Etten
O. F. Gayton R. F. Gayton
Plans, Superintendence-Reports, Valuations, Water, Gas, Electric Plants, Bridges, Buildings, Sewerage, Sewage Disposal
Webster Building, Chicago

Washtenaw Engineering Company
ANN ARBOR, MICH.
Water Supply; Sewerage and Sewage Disposal; Refuse Disposal; Roads and Pavements; Highway Bridges and Culverts; Drainage; Land Surveying, Subdividing, and Platting; Municipal Accounts and Systems; Municipal Street Lighting.

COTT TWOGOOD
and Sanitary Engineer
Bank of Commerce and Trust Bldg.
MEMPHIS, TENN.
pply, Water Purification, Sewerage Sewage Disposal, Reinforced Conuctures, Municipal Improvements, of Purification Plants, Laboratory Analysis of Water and Sewage.

WARREN ENGINEERING CO.
Specializing in Municipal Water Supply and Purification, Sewerage and Sewerage Disposal, Paving.
DECATUR ILLINOIS

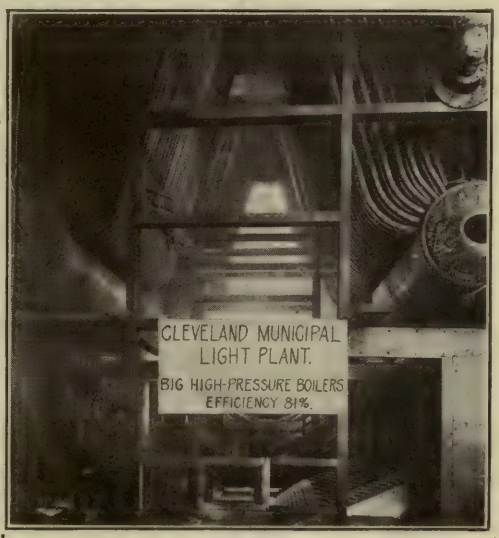
MARK WOLFF
Certified Public Accountant
Consultant
Rate & Capitalization Cases
Gas, Electric & Water Utilities
1328 Broadway
New York City
Municipal Accounting

ert W. Hunt Jno. J. Cone Jas. C. Hallsted D. W. McNaugher
ROBERT W. HUNT & CO., GENERAL OFFICES: 2000-175 W. Jackson Blvd., Chicago, Ill.
ENGINEERS, INSPECTORS, CHEMISTS
Inspection Steel and Cement for Buildings and Bridges, Paving Materials, Cast Iron Pipe.
Inspectors Permanently at Points of Manufacture.

OFIELD ENGINEERING COMPANY, PHILADELPHIA
Consulting Engineers
An organization of thoroughly trained experts with a wide successful experience in
LIC SERVICE PROPERTIES, INDUSTRIAL AND TEXTILE PLANTS, REFRIGERATION, MUNICIPAL IMPROVEMENTS

Arrows on window show direction of incoming fresh air.

More AIR—More WORK
More ENERGY—Better HEALTH
by using
DEAL VENTILATORS
windows in your office. Prevent draughts, o not obstruct light, save papers from blowg away. Inexpensive; made of glass.
Used in Federal, State and City offices all er the country.
Write TODAY for descriptive circular.
IDEAL VENTILATOR CO.
20 Liberty Street, New York City
Phone Rector 1339.



We Can Do The Same For You!
We are Consulting Engineers for Municipalities.
We designed, built and operated the Cleveland Municipal plant. Its maximum rate is 3 cents per K. W. hour.
We represent cities in negotiations with the Utility Corporations.
We prepare valuations and represent cities before the State Commissions in rate cases for Electric Light, Gas, Telephone, Water Works and Railway Fare Cases.
Write for Printed Matter
F. W. BALLARD & CO.
Engineers
Sweltand Building Cleveland, Ohio

The Noiseless Typewriter

Increases productive power by giving the mind a fair chance.

Hence at a time of world crisis it is the helpful servant of those who with intense effort are bending their energy to accomplish great results.

Readers of this Magazine will be interested to learn that the Noiseless Typewriter is used exclusively in the office of the American City.

Send for literature and an impressive list of users; or better still, ask for a demonstration and test at your own office.

The Noiseless Typewriter Company

253 BROADWAY, NEW YORK

Other Offices in

CHICAGO
PHILADELPHIA
BOSTON
DETROIT
CLEVELAND
SAN FRANCISCO
LOS ANGELES
and MONTREAL

DU PONT AMERICAN INDUSTRIES

Paint Through Rust—Not Over It

Mail this Coupon marking X before subject that interests you

- ___ Antoxide Metal Paint
- ___ Industrial Paints
- ___ Ry. and Marine Paints
- ___ Auto Enamel
- ___ Rayntite Top Material
- ___ Motor Fabrikoid
- ___ Craftsman Fabrikoid
- ___ Industrial Dynamites
- ___ Trapshooting
- ___ Commercial Acids
- ___ Challenge Collars
- ___ Py-ra-lin Toilet Goods

Name.....

Address.....

City.....

State.....

Visit Du Pont Products Store
1105 Boardwalk, Atlantic City, N. J.

Rust is a metal eater. To paint over it is merely camouflage. The destructive action still continues underneath the paint. The only efficient way to stop this evil is to paint through the rust.

HARRISON ANTOXIDE

is a foe to rust because it is rust inhibitive. It stops rust's action because it permeates the rust or scale, checks its progress and actually protects the metal underneath. It preserves the metal from oxidization because it eliminates the cause of this destructive agent. For this reason it is incomparable for painting iron fences, drains and all kind of metal work. Comes in five standard shades—red, bronze, green, maroon and black.

Check Antoxide in the coupon. Sign and send it in. Get the full information.

Harrison Works

Philadelphia Pa.

Owned and Operated by

E. I. du Pont de Nemours & Company

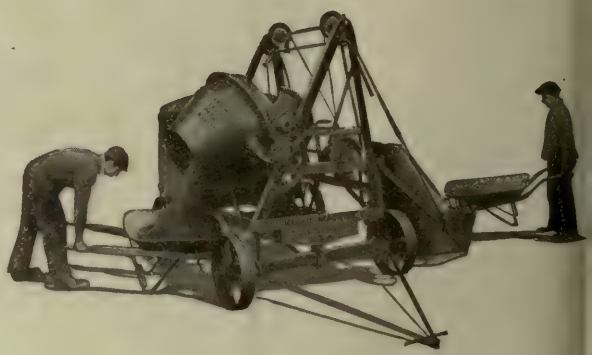
DU PONT

Jaeger Concrete Mixer

Used by all progressive municipalities and contractors.

Is your town progressive?

Write for Data



THE JAEGER MACHINE CO.

215 West Rich Street :: Columbus, Ohio

WHO SAID "BRICKS?"

We are in the heart of the first quality shale lands and we are planning to make brick for every conceivable purpose.

We invite correspondence from municipal officials or anybody else seeking information about brick, conduits or building brick.

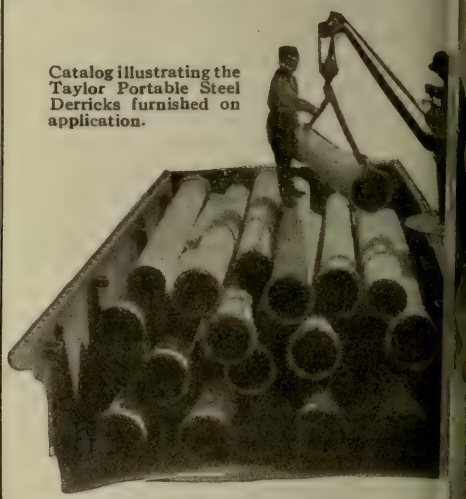
The Schuylkill Valley Vitrified Products Co.

Oaks, Montgomery County, Pa.

The TAYLOR

PORTABLE STEEL DERRICK with Gon Car Attachment for HANDLING PIPE other heavy material from gondola

Catalog illustrating the Taylor Portable Steel Derricks furnished on application.



TAYLOR PORTABLE STEEL DERRICK CO.

213 W. Grand Ave., Chicago, Ill.

Street Signs Road Guide Posts Traffic Signs

The Kind That Last

Made of Heavy Galvanized Iron with letters sunken into plate.

If you are looking for *permanent* signs instead of the short lived ordinary variety write to us for prices, illustrations and further particulars.

Union Iron Products Co.
Drawer H-2 E. CHICAGO, IND.

tleford Tar Heaters

Many municipalities have found the "Littleford" a valuable and economical asset in Street Repair work.

Write for booklet.

EFORD BROS. 500 E. Pearl St., Cincinnati

We will demonstrate to the satisfaction of any State or County Official that

THE ONE MAN COLLAPSIBLE CULVERT FORM

Adjustable for 39 Different Sized Culvert Openings

Will Cut Culvert Costs Tremendously

This form makes possible the Permanent Concrete Culvert at Small Cost.

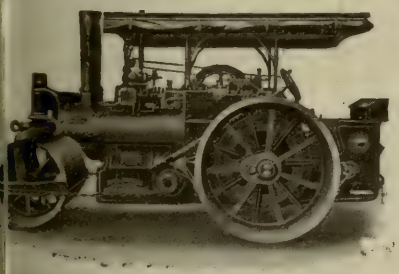
Don't Specify or Build Culverts of any type until you have read our Booklet—sent on request.

Permanent drainage at reasonable cost is what you want. Our booklet shows you how to build Culverts from the smallest to the largest of Concrete at a surprising saving in cost over other methods. Metal Pipe, Vitrified Tile and Cement Tile are all compared and figures given. Write for the booklet. Sent without charge on request.

Sto ms Manufacturing Company 347 Monadnock Block CHICAGO, ILL.

We can also supply special designs and sizes of collapsible forms for storm sewers (leased on percentage basis).

QUALITY MACHINERY



BUFFALO PITTS ROLLERS

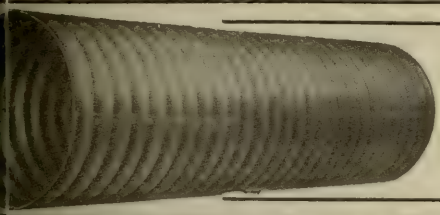
Are purchased by discriminating buyers because of the many years of satisfactory service which they will render, the low repair costs and their general reliability.

ASK THOSE WHO OWN THEM

All sizes All Types Write for catalogue

Built only by

THE BUFFALO-SPRINGFIELD ROLLER COMPANY
SPRINGFIELD, OHIO



Collieries Supply and Equipment Co.

Culvert Pipe and Road Machinery

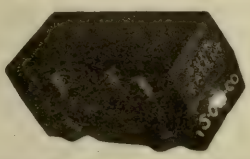
Contractors, Road Makers and Municipal Supplies

Sectional Cast Iron Culvert Pipe Corrugated Iron Culvert Pipe Scarifiers Road Signs Road Scrapers Road Drags Rock Crushers Road Rollers Write for Prices

14 North Fifth Street Philadelphia Pa.

UTHERN CLAY MFG. CO.

James Building
ATTANOOGA, TENN.



Annual Capacity: Thirty Million Paving Blocks

Manufacturers of

WIRE-CUT-LUG BLOCKS
DUNN PATENT

WIDELY USED STANDARD SURVEYING BOOKS

The Theory and Practice of Surveying

Designed for the Use of Surveyors and Engineers Generally.

By J. B. Johnson, C. E., Late Dean of the College of Mechanics and Engineering of the University of Wisconsin. Seventeenth Edition, Rewritten by Leonard S. Smith, C. E., Associate Professor of Topographic and Geodetic Engineering, University of Wisconsin. Total Issue, 49,000.

From the date of its original issue, in 1886, the demand for this standard work necessitated the printing of approximately 34,000 copies. Since the thoroughly revised and reset Seventeenth Edition was first placed on the market in 1910, the continued usefulness of the book has called forth 15,000 more.

xxxii+921 pages. 5¼ by 8. 263 figures. Cloth, $3.50 net.

Plane Surveying

A Text-Book and Pocket Manual. Total Issue, **29,000.** xxvii+794 pages. 4 by 6¾. Illustrated. Flexible binding, $3.00.

Exercises In Surveying For Field Work and Office Work

Total Issue, **5,000.** xiv + 169 pages. 4¾ by 7¼. Flexible binding, $1.00 net.

The above two books in one volume. 4 by 6¾. Flexible binding, $3.00 net.

By John Clayton Tracy, C. E., Professor of Civil Engineering, Sheffield Scientific School of Yale University.

A text-book and pocket manual combined, treating with great thoroughness fundamental principles and methods. Has proved of great use to men in actual practice as well as to students.

The Principles and Practice of Surveying

By Charles B. Breed and George L. Hosmer, Professor of Railroad Engineering and Associate Professor of Topographical Engineering respectively, Massachusetts Institute of Technology.

Volume I. Elementary Surveying

Fourth Edition, Total Issue, **28,000.** xix+591 pages. 4¾ by 7. 216 figures. Flexible binding, $3.00.

Volume II. Higher Surveying

Second Edition, Total Issue, **12,000.** xvii+443 pages. 4¾ by 7. 158 cuts and 7 full-page plates. Flexible binding, $2.50.

Now issued in pocket size, without reducing the size of type. In Volume I the subject of Stadia Surveying has been fully treated in a new chapter. In Volume II the older methods and instruments for measuring base-lines have been subordinated, and attention has been given particularly to the use of the Invar tape and to the recent methods and results of the United States Coast and Geodetic Survey.

10 DAYS FREE EXAMINATION

John Wiley & Sons, Inc., 432 Fourth Ave., N. Y. City.

Gentlemen:—Kindly send me for 10 days free examination the following books:

.....

.....

.....

It is understood that I am to remit the price of these books, or return them, carriage charges prepaid, within 10 days after their receipt.

Name.....

Address.....

(Indicate on the line above if you are a subscriber to American City; or give the name of the engineering society of which you are a member. If you are not a member of any society, kindly give a reference or state your position. AC 3-18

Free Examination — No Cash In Advance

You can examine these books for 10 days without sending cash in advance. This privilege is extended to subscribers to *American City,* or to members of any National engineering society. If you are not a subscriber or a member of any society, you can supply a reference or indicate your position.

JOHN WILEY & SONS, Inc.

432 Fourth Avenue, New York

London: CHAPMAN & HALL, Ltd.

Montreal, Canada
Renouf Publishing Co.

Manila, P. I
Philippine Education Co

"KOLESCH"

LONG SERVICE

Engineering Instruments

nbine in their design and manufacture all the latest improve-
nts, and have established an enviable reputation for *unvarying*
iability.

e will gladly send you an instrument to try out
yourself absolutely without obligation to purchase
less it proves to be "the instrument you want."

Send for Bulletin of Engineers' Supplies

OLESCH & CO., 138 Fulton St., New York

DORLESS STAINLESS

DUSTOLINE FOR ROADS

RACKLESS (TRADE MARK) TRANSPARENT

THE DUSTOLINE FOR ROADS CO., Summit, N. J., Phone 33

Has none of the objectionable features of the black asphaltic oils or tar preparations

PIONEER Highest Quality ASPHALTS

"High Quality Materials for High Quality Work"

Bituminous Materials for every purpose

THE PIONEER ASPHALT CO.

7325 Woodlawn Ave., Chicago, Ill.

MOTOR TRUCK AND HORSE DRAWN

FLUSHERS—SPRINKLERS—OILERS

Also Flushing, Sprinkling and Oiling
Units complete for mounting on trucks

E. D. ETNYRE & CO. : OREGON, ILL.

The Longest Service Paint for Metal and Wood Surfaces

DIXON'S SILICA GRAPHITE PAINT

Made in First Quality Only

Favorably known for over fifty years. Time-tests prove it o be the most durable for iron fences, tanks, cornices, smoke-stacks, fire escapes, pipes, boiler fronts, and any kind of metal or wood work requiring protection.

May we count Y O U among our valued paint customers? Write for Booklet No. 107 B and long service records.

Made in JERSEY CITY, N. J. by the
JOSEPH DIXON CRUCIBLE CO.

Established 1827

BUFF

ENGINEERING INSTRUMENTS

are the strongest, most accurate and longest-lived Instruments built. The close accuracy, high grade materials and superior workmanship have made the Buff the recognized standard. *Write for catalog No. 4.*

BUFF & BUFF MFG. CO. Jamaica Plains, BOSTON, MASS.

221 Lamartine Street 231 N. Wells Street, Chicago, Ill.

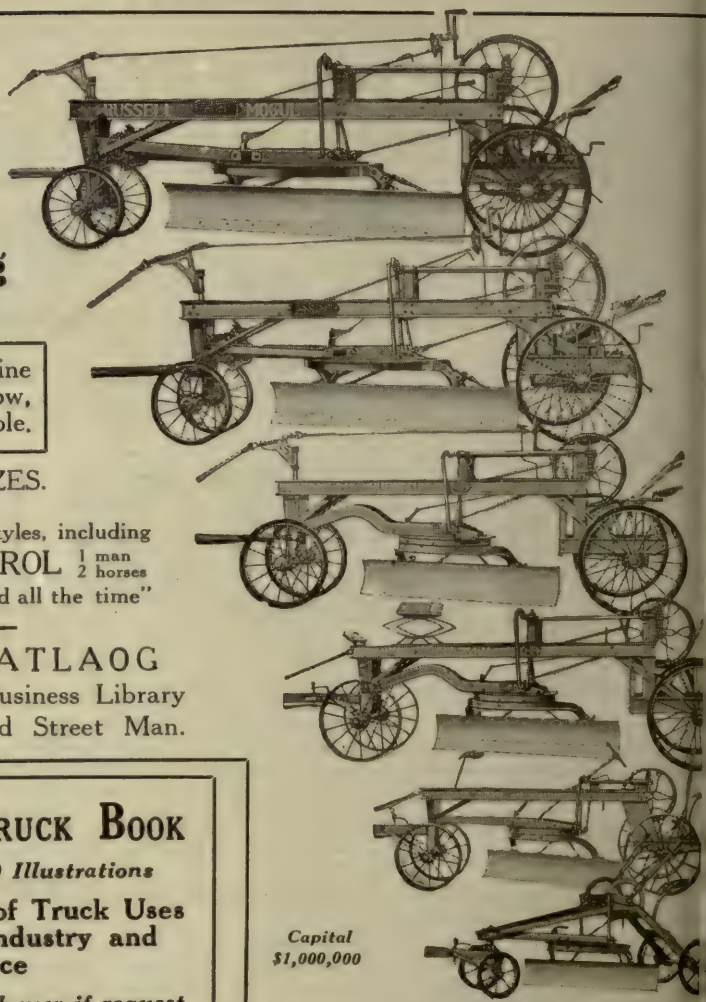
The
Secret of Success in Road Work and Earth Handling lies in this:

Buy the largest machine for which power is now, or will soon be available.

We present here 6 SIZES.

We also make 4 more styles, including
The HI-WAY PATROL 1 man 2 horses
to "Keep Good Roads good all the time"

Our 1918 CATLAOG
should be in the Business Library of every Road and Street Man.



Capital $1,000,000

RUSSELL GRADER MFG. C
Minneapolis, Minn.
Representatives in Principal Cities of U. S and Canada

***The* WHITE TRUCK BOOK**

250 Pages *1400 Illustrations*

A Graphic Record of Truck Uses in all Lines of Industry and Commerce

Sent gratis to any truck user if request is signed by responsible official

THE WHITE COMPANY
CLEVELAND

Municipal Officials
Should Refer To
The Municipal Buyers Guide
Beginning on page 90

"TRANSPORTATION"

s a big essential in winning the war and you must have "Good Roads" to have a perfect transportation system as the railroads and waterways are now overburdened with shipments and are unable to take care of them. The bulk of the burden of relieving rail congestion **must rest on the highways.**

Surface Your Macadam Roads with WARRENITE

and have roads which will withstand the motor truck rransportation.

WARRENITE has been used for surfacing many contonment roads and has proven very satisfactory.

Specify the Economy Road Surface

WARRENITE

Build Roads, Build Good Roads AND BUILD THEM NOW

Don't Wait—It will be a big mistake if you do—for never were GOOD ROADS more needed than at the present time.

BUILD ROADS FOR NOW AND THE FUTURE

INSIST ON WARRENITE

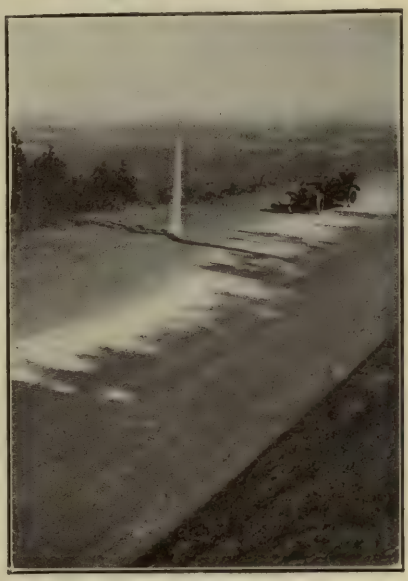
Write today for WARRENITE circulars, specifications, and form of mixture agreement, available to all contractors and learn more about this Modern Ideal Country Road Surface which will withstand all climatic conditions. **IT IS TO YOUR ADVANTAGE.**

WARREN BROTHERS COMPANY

Executive Offices: Boston, Mass.

District Offices:

New York, N. Y. San Francisco, Cal. St. Louis, Mo.
Richmond, Va. Los Angeles, Cal. Phoenix, Ariz.
Nashville, Tenn. Portland, Ore. Utica, N. Y.
Chicago, Ill. Winnipeg, Man. Toronto, Ont.
Vancouver, B. C. Montreal, P. Q.



Warrenite,
Terwilliger Boulevard, Multnomah County, Ore., Overlooking the City of Portland.

CONNERY
Non-Leakable Welded
"Held by Weld"

Tar and Asphalt heating kettles. All sizes and styles. Write for specifications.

Style N. 150 Gallons
Fire Door both Ends
Two Cock
Adjustable Lever
Barrel Heating and Dipping Top
Most complete heater of its kind.

Style G. 17 Gallons
Handy Man's Kettle

Service, Economy and Durability.

Stock carried in large cities. Manufactured by

CONNERY & CO. Inc. 2nd & Luzerne Sts. Phila, Pa.

PENNSYLVANIA PORTLAND CEMENT

"One Source—One Mill—One Standard"

Every bag of Pennsylvania Cement, wherever obtained and for whatever purpose, has the same high quality required for government and public service work in which it is extensively used. Ask your dealer for Pennsylvania. If he cannot supply you, write direct to

Pennsylvania Cement Company, 30 East 42nd St., New York

ROADWAY ECONOMY

SOLVAY Granulated Calcium Chloride keeps roads clean, dustless, durable and sanitary at a minimum expense.

SOLVAY

Granulated

Calcium Chloride

can be applied by ordinary road-laborers, and a few applications a season are sufficient to keep the road in perfect condition all the year round.

Solvay Granulated Calcium Chloride is a dry, stain'ess, colorless, odorless chemical salt — unquestionably the most economical and satisfactory dust preventive and road binder.

All interested in good roads are invited to write for the "Solvay Road Book", mailed free upon request.

SEMET-SOLVAY CO.
410 Milton Ave. :: Solvay, N. Y.

BUY WAR SAVINGS STAMPS

Adams Scarifier-Grader Resurfacing Macadam Road

Leaning Wheels Give Tremendous Power

By *Leaning* its weight agains the load—the *natural* way—th Adams Scarifier-Grader moves mor dirt with less power and expense tha can be done by any other methoc In scarifying or grading and shapin up of gravel or macadam streets, thi extra power and ease of operation is c unquestioned advantage. The

ADAMS
ADJUSTABLE
Leaning-Wheel
GRADER

is guaranteed in actual road buildin or maintenance, to move more di with less *power* (mold board scourin and without side draft on the powe than any other grader of same lengt blade.

The economy and efficiency of th ADAMS Adjustable Leaning-Wheel Grader c be PROVED by TEST on your own road, befo a sale is made. Write for free illustrated catal showing ADAMS Adjustable Leaning-Whe Graders at work under various conditions. A for Catalog C.

The ADAMS Leaning-Wheel Grader leans against the load just as you'd do if you were pushing a loaded wheelbarrow up a hill. Catalog C gives full information.

J. D. ADAMS & CO.
Road Building Machinery
INDIANAPOLIS, IND.

and so does the ADAMS grade

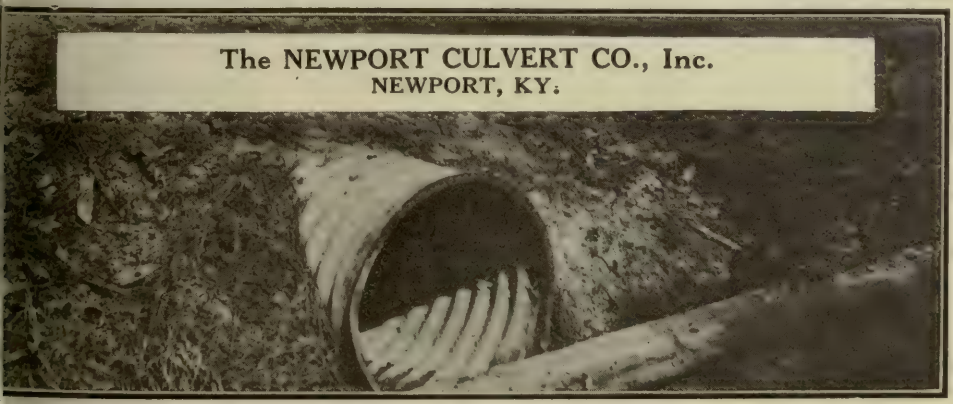
A City Official

writing us recently says among other things: "Your

'Genuine Open Hearth Iron' Culverts

re certainly well adapted to city use as they can be laid nearer the surface of our treets than other types of culvert and are much easier installed than the pipes hat come in short sections."

A pure Iron-Copper Alloy Sheet with a heavy spelter coat makes an ideal naterial for culvert construction. And that's what our culverts are made of. They are practically permanent. Let us send you our booklet and prices.



The Municipal Buyers' Guide

A classified reference index of advertisers in this issue of The American City

The alphabetical index of advertisers which follows this list (see page 100) will give you the page numbers of all advertisements, thus enabling you to secure the full address of the advertisers, as well as other information which may be of value.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 10

Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark

Aerial Ladder Trucks.
Couple-Gear Freight-Wheel Co.

Air Compressors.
General Electric Co.
Modern Iron Works
Water Works Equipment Co.
Worthington Pump & Mach. Corp.

Air and Gas Washers.
Spray Engineering Co.

Ambulances.
White Co., The

Antoxide.
Harrisons, Inc.

Arc Lamps.
General Electric Co.
Westinghouse Elec. &Mfg. Co.

Armored Concrete Pavements.
Trussed Concrete Steel Co.

Asbestos.
Carey Co., Philip.

Asphalt.
Carey Co., Philip.
Pioneer Asphalt Co.
Standard Oil Co.
Warren Bros. Co.

Asphalt Machinery.
Casey-Hedges Co.
Connery & Co., Inc.
Littleford Bros.
Warren Bros. Co.

Automobile Fire Apparatus.
American-La France Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Couple-Gear Freight-Wheel Co.
Duplex Truck Co.
Federal Motor Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
South Bend Motor Car Works.
Sterling Motor Truck Co.
The White Co.

Automobile Lubricants.
Joseph Dixon Crucible Co.

Belt Dressing.
Joseph Dixon Crucible Co.

Blasting Supplies.
DuPont de Nemours & Co., E. I.

Blue Print Paper and Machines.
Kolesch & Co.

Braces, Extension.
Bond & Co., Harold L.
Modern Iron Works.

Brass Goods.
Anderson Coupling & Fire Sup. Co.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co

Brick, For Paving.
Dee Co., Wm. E.
Metropolitan Paving Brick Co.
Southern Clay Mfg. Co.
Schuylkill Valley Vit. Products Co.

Buses, Motor.
White Co., The

Calculating Machines.
Marchant Cal. Machine Co.

Campaigns for Commercial Organizations.
American City Bureau.

Cans for Ashes and Garbage
American Can Co
Buffalo Municipal Equipment Co.
Butler Mfg. Co.
Newport Culvert Co.
Rochester Can Co.
Steel Basket Co.

Can Carriers.
Steel Basket Co.

Cast Iron Pipe.
Donaldson Iron Co.
Glamorgan Pipe & Foundry Co.
Lynchburg Foundry Co.
Massillon Iron and Steel Co
Zelnicker Supply Co., W. A.

Catch Basins.
Buffalo Municipal Equipment Co.
Casey-Hedges Co.
Clark Co., H. W.
Dee Co., Wm. E.
Modern Iron Works.
U. S. Cast Iron Pipe & Foundry Co

Catch Basin Cleaning Apparatus
Otterson Auto-Eductor Co.

Caulking Materials.
Leadite Co.
Modern Iron Works.
United Lead Co.

Cemcoat.
Sonneborn Sons, Inc., L.

Cement
Atlas Portland Cement Co.
Pennsylvania Cement Co.

Cement Inspection.
Allentown Testing Laboratories.
Hunt & Co., Robt. W.

Centrifugal Pumps.
Shone & Co.
Worthington Pump & Mach. Corp.

Certified Public Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark

Check Valves.
Columbian Iron Works.

Chemical Analysis.
Allentown Testing Laboratories.
Hunt & Co., Robt. W.

Chemical Engines.
American-La France Fire Engine Co
Anderson Coupling & Fire Sup. Co.

Chemical Engineers.
Hunt & Co., Robt. W.

Chemicals for Water Purification.
Arnold, Hoffman & Co.
Bush-Beach & Gent.
Electro Bleaching Gas Co.
General Filtration Co.
Great Western Electro Chem. Co.
Pennsylvania Salt Mfg. Co.
Wallace & Tiernan Co., Inc

Coal Tar.
Barrett Co., The
Carey Co., Philip.

Cold Storage and Refrigera Systems.
Spray Engineering Co.

Concrete Culverts.
Storms Mfg. Co.

Concrete Mixers.
Jaeger Machine Co.
Worthington Pump & Mach.

Conduit Rods.
Bissell Co., F.
Bond & Co., Harold L.
Turbine Sewer Machine Co.

Conduits.
Fibre Conduit Co.
Schuylkill Valley Vit. Prod. C

Contractors' Equipment.
Adams & Co., J. D.
Austin-Western Road Machy.
Bond Co., Harold L.
Connery & Co., Inc.
Duplex Truck Co.
Federal Motor Truck Co
Garford Motor Truck Co.
General Motors Truck Co.
Good Roads Machinery Co.
Littleford Bros.
Packard Motor Car Co.
Ransome Leach Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.
Sterling Motor Truck Co.
Universal Road Machinery C

Contractors for Water Main C ing.
National Water Main Cleanin

Culverts.
American Cast Iron Pipe Co
Casey-Hedges Co.
Clow & Sons, James B.
Collieries Supply & Equipmen
Dee, Wm. E. Co.
Good Roads Machinery Co.
Newport Culvert Co.
Trussed Concrete Steel Co.
Sewer Pipe Mfrs. Association
Storms Mfg. Co.
U. S. Cast Iron Pipe & Found
Wood & Co., R. D.

Curb Bar.
Trussed Concrete Steel Co.

Curb Boxes.
Casey-Hedges Co.
Clark Co., H. W.
East Iron & Machine Co.
Modern Iron Works
S. E. T. Valve & Hydrant C

Current Meters.
Westinghouse Electric & Mf

Derricks.
Taylor Portable Steel Derricl

Drawing Instruments and plies.
Gurley, W. & L. E.
Kolesch & Co.

Dump Carts and Wagons.
Austin-Western Road Mach
General Motors Truck Co.
Watson Wagon Co.

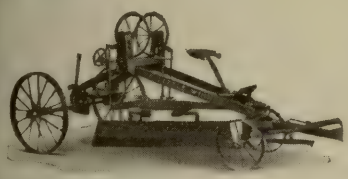
Dumping Wagon Bodies.
Austin-Western Road Machy

Continued on page 92

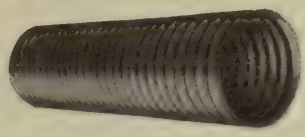
THE MAN WITH THE MACHINE

Is the man who gets results in road and street making.

We furnish machines for every class of street work—Grading, Crushing, Rolling and Oiling.

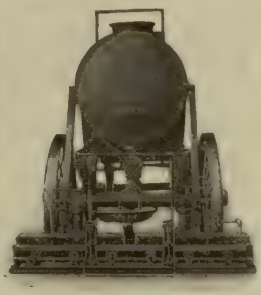


The Little Winner Light Reversible Road Machine. Used with two, three or four horses. Keeps dirt roads and streets smooth and level at little expense.



Corrugated Metal Culvert Pipe. Easy to handle. Convenient to lay. Made in many different sizes, from 8″ to 72″ diameter.

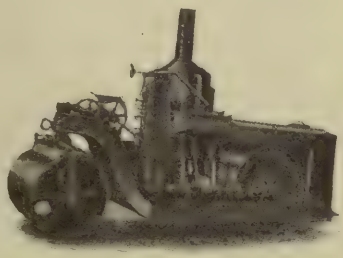
Labor shortages and freight embargoes mean delayed shipments. The only remedy is to order early. If you would have your machinery on time, Order NOW.



Our catalogue, "Everything for the Road Maker" is an interesting and instructive book. A copy is yours if you ask for it.

The Monarch Pressure Distributor applies light oils and tar products. Capacity 600 gallons. Furnished for horse or auto truck power. We also furnish a complete line of Heating Kettles.

The Champion Portable Rock Crushing Outfit. Made in many sizes from 60 to 300 tons daily capacities.



Monarch Tandem Roller. Made in 5, 6, 9, and 10 ton sizes.

Inquiries will receive cheerful attention.

THE GOOD ROADS MACHINERY COMPANY

Kennett Square, Pa.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 10

Dust Laying Compounds.
Barrett Mfg. Co.
Dustoline for Roads Co.
Semet-Solvay Co.
Standard Oil Co.

Electric Current Meters.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Generators and Motors.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Lamp Fixtures.
Cutter Co., George.
Electric Railway Equipment Co.

Electric Lamps.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electrical Supplies.
Bissell Co., F.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Enameled Iron Signs.
Baltimore Enamel & Novelty Co.

Engineers' and Surveyors' Instruments.
Buff & Buff Mfg. Co.
Kolesch & Co.

Engineers, Consulting.
Albright & Mebus.
Alvord, John W. & Brudick, Chas.
Ballard & Co., F. W.
Black & Veatch
Blanchard, A. H.
Burns & McDonnell.
Caird, James M.
Chester & Fleming.
Cravath, J. R.
Crosby, W. W.
Duluth Engineering Co.
Dunham-Clarin Co.
Flood, Walter H.
Fuller & McClintock.
Gannett, Seelye & Fleming.
Greeley, Samuel A.
Gregory, John H.
Harding, James.
Hazen, Whipple & Fuller.
Hering, Rudolph
Higgins, J. Wallace.
Hopkins, Charles C.
Hunt & Co., Robt. W.
Jennings, Lawrence & Lindsey.
Johnson, Geo. A.
Kimberly, A. Elliot
Knowles, Morris.
Leavitt, Chas. W.
Ludlow, J. L.
McCrary Co., J. B.
Minnesota Engineering Co.
Mitchell, Hugh C.
Pollock, Clarence D.
Potter, Alexander.
Potts, Clyde.
Scofield Engineering Co.
Utilities Engineering Co.
Warren, Engineering Co.
Washtenaw Engineering Co.

Engine, Gas (See Gas Engines.)

Expansion Joint Material.
Barrett Mfg. Co.
Carey Co., Philip.
Pioneer Asphalt Co.
Trussed Concrete Steel Co.

Fencing.
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Co.
Wright Wire Co.

Fertilizers.
Dreer, Henry A.

Filters-Feed Water.
Pittsburgh Filter Mfg. Co.

Filtration Plants.
N. Y. Continental-Jewell Filtra. Co.
Norwood Engineering Co.
Pittsburgh Filter Mfg. Co.

Fire Alarm Cables
Bissell Co., F.
Simplex Wire & Cable Co.

Fire Alarm Signals, Steam.
Union Water Meter Co.

Fire Alarm Systems.
Anderson Coupling & Fire Sup. Co.
Gamewell Fire Alarm Telegraph Co
Loper Fire Alarm Co.

Fire Department Apparatus.
American-LaFrance Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Couple-Gear Freight-Wheel Co.
Duplex Truck Co.
Federal Motor Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
South Bend Motor Car Works.
Sterling Motor Truck Co.
White Co. The

Fire Department Supplies.
Anderson Coupling & Fire Sup. Co.

Fire Escapes.
Barnum Iron Works, E. T.

Fire Extinguishers, Chemical.
American LaFrance Fire Engine Co
Anderson Coupling & Fire Sup. Co.

Fire Hose.
Anderson Coupling & Fire Sup. Co.
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

Fire Pumps.
Worthington Pump and Machinery Corporation.

Flag Poles.
Barnum Iron Works, E. T.

Flexible Joints.
U. S. Cast Iron Pipe & Fdry. Co

Flower Bed Guards.
Barnum Iron Works, E. T.
Wright Wire Co.

Fountains.
Barnum Iron & Wire Works, E. T
Casey-Hedges Co.
Clow & Sons, James B.
Mott Iron Works, J. L.
Rundle-Spence Mfg. Co.
Stewart Iron Works Co.

Furnaces, Melting.
Leadite Co.
Modern Iron Works

Garbage Cars—See Cans for Ashes and Garbage.

Garbage Wagons.
Austin-Western Road Machy. Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
Watson Wagon Co.
White Co., The

Gas Engines.
Bruce-Macbeth Engine Co.
Westinghouse Electric & Mfg. Co.
Worthington Pump & Mach. Corp

Gaskets.
Leadite Co.

Gas Meters.
General Electric Co.
Pittsburgh Meter Co.

Gasoline Pumping Engines.
Bond Co., Harold L.
Modern Iron Works
Worthington Pump & Mach. Corp.

Gasoline Storage Tanks.
Bowser & Co., Inc., S. F.

Gates For Parks and Cemeteri
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Company
Wright Wire Co.

Gauges—Surface, Reservoir Special Water Works.
Clark Co., H. W.

Graders.
Adams & Co., J. D.
Austin-Western Road Machy.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Graphite.
Dixon Crucible Co., Joseph.

Grass Seed.
Burpee Co., W. Atlee
Dreer, Henry A.
Thorburn & Co., J. M.

Health and Amusement Devic
American Playground Device C
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.
Noll Bros.

Heating Kettles.
Connery & Co., Inc.

Hitching Posts.
Barnum Iron & Wire Works, E
Casey-Hedges Co.

Hose.
Anderson Coupling & Fire Sup
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

House Numbers.
Baltimore Enamel & Novelty
Buffalo Municipal Equipment C

Hydrants
Clow & Sons, James B.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Mfg. Co.
Norwood Engineering Co.
Pratt & Cady Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co
Wood & Co., R. D.

Indicator Posts.
Columbian Iron Works.
Flower-Stephens Mfg. Co
Ludlow Valve Mfg. Co.
Pratt & Cady, Inc.
Rensselaer Valve Co.

Insulating Materials.
Bissell Co., F.
Carey Co., Philip.
General Electric Co.
Westinghouse Electric & Mfg.

Insulated Wire and Cable.
Bissell Co., F.
General Electric Co.
Simplex Wire & Cable Co.

Iron Collapsible Forms For Mo ing Concrete.
Clark Co., H. W.
Ford Meter Box Co.
Stroms Mfg. Co.

Jail Cells and Jail Work.
Barnum Iron Works, E. T.

Joints, Flexible.
Coldwell-Wilcox Co.

Kahn Armour Plates.
Trussed Concrete Steel Co.

Continued on page 94

BACK OF THE PERFECT CURBING ARE KAHN CURB BARS

ey provide the and most econom- method of pro- ng and reinforcing ete curbing for r business or resi- al streets. There o separating or ing of the con- at the corners, on nt of the open s in the anchorage, n is absolutely ive.

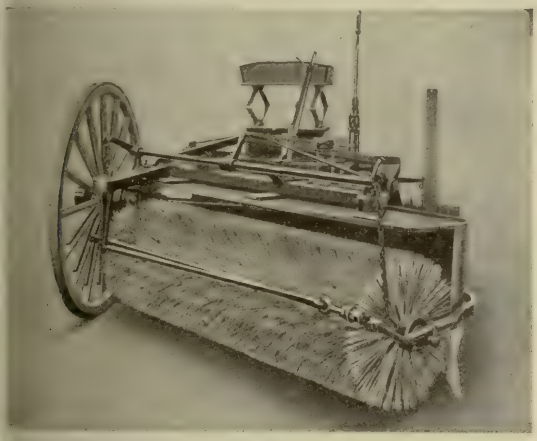
Kahn Curb Bars are manufactured from special rolled steel sections, and are heavily galvanized after forming. They are furnished in either straight or curved bars and provide a protection of 1⅝ inches. Standard lengths 8, 10 and 12 feet.

TRUSSED CONCRETE STEEL COMPANY

Department C-43 **Youngstown, Ohio**

Representatives in Principal Cities

STANDARD WEED TRUSCON BUILDING PRODUCTS



Clean Streets

In order to have and maintain clean, "dustless" streets, the use of a strong, durable street sweeper is essential. The Reliance Sweeper has won fame throughout the contry as THE sweeper. Sweeps clean any kind of pavement. Simple in construction—simple to operate. Made of the best materials.

Effectiveness, Strength and Durability are its Main Features.

WRITE FOR ILLUSTRATED BOOKLET

THE UNIVERSAL ROAD MACHINERY CO.

KINGSTON, N. Y.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 100

Kettles, Tar and Asphalt.
Connery & Co., Inc.

Landscape Architects.
Arnold, Sheffield A.
Cole, Louis S.
Cowell, Arthur W.
Cullen, Wm E.
Davey Tree Expert Co.
Hare & Hare.
Helder, Arthur H.
Higgins, J. Wallace.
Horvath, M. H.
Leavitt, Chas. W.
Nutter, Frank H.

Lapidolith.
Sonneborn Sons, Inc., L.

Lawn Mowers.
Austin Western Road Machy. Co.
Manufacturers Distributing Co.
Pennsylvania Lawn Mower Works
Shawnee Mower Co.
Townsend & Co., S. P.

Lawn Sweepers and Sprinklers.
Everwear Mfg. Co.
Pennsylvania Lawn Mower Co.
Spray Engineering Co.

Lead Furnaces and Caulking Tools.
Modern Iron Works.
Water Works Equipment Co.

Leadite.
Leadite Co.

Lead Wool.
United Lead Co.

Leak Finders.
Clark & Co., H. W.
Modern Iron Works
Pitometer Co.
Water Works Equipment Co.

Liquid Chlorine.
Arnold, Hoffman & Co.
Bush-Beach & Gent.
Electro Bleaching Gas Co.
Great Western Electro Chem. Co.
Pennsylvania Salt Co.
Wallace & Tiernan Co., Inc.

Lighting Standards.
Casey-Hedges Co.
Cutter Co., George.
Electric Railway Equipment Co.
King Foundry Co.
Mott Iron Works, J. L.
Stewart Iron Works Co.

Lubricants.
Dixon Crucible Co., Joseph.

Manhole Covers.
Barnum Iron Works, E. T.
Casey-Hedges Co.
Clark Co., H. W.
Clow & Sons, James B.
Columbian Iron Works
East Iron & Machine Co.
Modern Iron Works.
Mott Iron Works, J. L.
S. E. T. Valve & Hydrant Co.
U. S. Cast Iron Pipe & Foundry Co.
Wood & Co., R. D.

Merry-Go-Rounds.
American Playground Device Co.
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.

Metal Preservatives.
Dixon Crucible Co., Joseph.
Harrisons, Inc.

Meter Books.
Buffalo Meter Co.
Pittsburgh Meter Co.

Meter Boxes.
Buffalo Meter Co.
Casey-Hedges Co.
Clark Co., H. W.
Clow & Sons, James B.
Columbian Iron Works.
Ford Meter Box Co.
Hersey Mfg. Co.
Modern Iron Works
Pittsburgh Meter Co
S. E. T. Valve & Hydrant Co.

Meter Couplings.
Clark Co., H. W.
Ford Meter Box Co.
Modern Iron Works
Pittsburgh Meter Co.

Meter Holding Devices.
Ford Meter Box Co.
Modern Iron Works

Meter Testers.
Buffalo Meter Co.
Clark Co., H. W.
Ford Meter Box Co.
Neptune Meter Co.
Pittsburgh Meter Co.

Meters—See Water and Gas Meters.

Motor Trucks.
Couple-Gear Freight-Wheel Co.
Duplex Truck Co.
Federal Motor Truck Co.
General Motors Truck Co.
Garford Motor Truck Co.
Packard Motor Car Co.
Sterling Motor Truck Co.
White Co., The.

Motor Fire Apparatus—See Automobile Fire Apparatus.

Motor Truck Trailers.
Watson Wagon Co.

Municipal Auditors
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark

Nurseries.
American Nusery Co.
Andorra Nurseries.
Bobbink & Atkins.
Donaldson Co.
Dreer, Henry A.
Harrison Nursery Co.
Hicks Nurseries.
Kohankie & Son, Henry
Meehan Co., Thomas.
Smith Co., W. & T.
Storrs & Harrison Co.

Oil Tanks.
Connery & Co., Inc.

Ornamental Metal Fencing.
Barnum Iron & Wire Works, E. T.
Mott Iron Works Co., J. L.
Stewart Iron Works Co.
Wright Wire Co.

Packing.
Carey Co., Philip.

Paint Gun (Pneumatic.)
Spray Engineering Co.

Park Management & Advice
Benjamin E. Gage

Park Benches.
American Playground Device Co.
Ashland Mfg. Co.
Barnum Iron & Wire Works E. T.
Casey-Hedges Co.
Enterprise Iron Works.
Mott Iron Works, J. L.
Noll Brothers.
Stewart Iron Works Co.

Park and Lawn Sprinklers.
Penn. Lawn Mower Works
Spray Engineering Co.

Park Swings.
Noll Brothers.

Paving Inspection.
Allentown Testing Laboratori
Hunt & Co., Robt. W.

Paving Machinery and Tools.
Warren Bros. Co.

Paving Materials. (See also n Brick and Cement.)
Barrett Co., The
Carey Co., Philip.
Schuylkill Valley Vitrified Prod
Standard Oil Co.
Warren Bros. Co.

Paving Mixers.
Warren Bros. Co.
Worthington Pump and Machi Corporation.

Paving Mixtures.
Standard Oil Co.

Pencils, Drafting, Office.
Dixon Crucible Co., Joseph.

Pipe.
American Cast Iron Pipe Co.
Casey-Hedges Co.
Cast Iron Pipe Pub. Bureau, McWane, Sec.
Central Foundry Co.
Clow & Sons, James B.
Donaldson Iron Co.
Glamorgan Pipe & Foundry
Lynchburg Fdry. Co.
Massillon Iron & Steel Co.
U. S. Cast Iron Pipe & Foundr
Warren Fdry. & Machine Co
Wood & Co., R. D.
Zelnicker Supply Co., W. A.

Pipe Covering.
Carey & Co., Philip.

Pipe Cutters.
Water Works Equipment Co.

Pipe Handling Machinery.
Taylor Portable Steel Derrick

Pipe Joint Compound.
Dixon Crucible Co., Joseph.

Pipe Jointing Materials.
Leadite Co.
United Lead Co.
Water Works Equipment Co.

Pipe Locators.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co.

Pitch.
Barrett Co., The
Carey Co., Philip.

Pitometers.
Pitometer Co., The

Playground Apparatus.
American Playground Device
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.

Continued on page 96

O DELAYS FOR LOADING WATSON TRAILERS

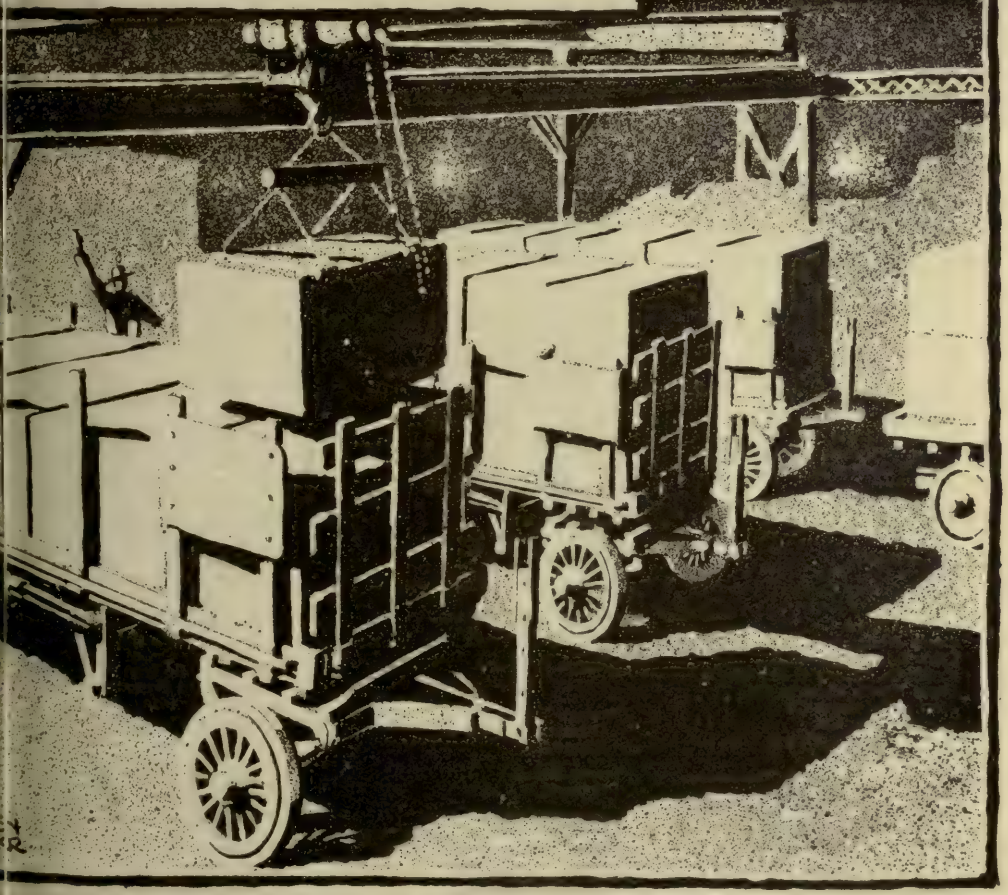
Set out your WATSON TRAILERS in the yard or on the job. Load or unload them without delaying your motor equipment. Trucks are away working while the gang handles the load on the trailers.

Use the full power of your motor equipment.

WATSON TRAILERS will increase the motor truck's hauling capacity as high as 400% in many cases.

Watson Trailers and Semi-Trailers are built in capacities up to 5 tons. Platform body or bottom dump. Full details on the pamphlet—"Heavy Hauling." Write for your copy.

WATSON WAGON Co
30 East Center Str.
Canastota, N.Y.



Every name in this list is represented by an advertisement in this issue of THE AMERICA CITY. The alphabetical index to all advertisements follows this classified list. See page 1

Pneumatic Tools.
United Lead Co.

Poles, Combination Railway and Lighting.
Cutter Co., George.
Electric Railway Equipment Co
Mott Iron Works, J. L.
Ornamental Lighting Pole Co.

Police Patrols.
General Motors Truck Co
White Co., The.

Police Signal Cables.
Simplex Wire & Cable Co

Police Signal Systems.
Gamewell Fire Alarm Telegraph Co.

Portable Derricks.
Taylor Portable Steel Derrick Co.

Portland Cement.
Pennsylvania Cement Co.

Powder.
DuPont de Nemours & Co., E. I.

Producers—Gas Power Plants.
Bruce-Macbeth Engine Co.
Westinghouse Electric & Mfg. Co.

Publishers.
Appleton & Co., D.
Engineering News-Record.
Wiley & Sons, John.

Pumping Machinery.
Bond Co., Harold L.
Deming Co.
Shone Co.
Wood & Co., R. D.
Worthington Pump and Mach. Corp.

Ramshorn Meter Holding Frame.
Ford Meter Box Co.

Reinforcing for Paving.
Trussed Concrete Steel Co.

Repair Lids for Service Boxes.
Clark Co., H. W.
Modern Iron Works.

Road and Street Machinery.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Barber Asphalt Paving Co.
Buffalo-Springfield Roller Co.
Connery & Co., Inc.
Duplex Truck Co.
Garford Motor Truck Co.
The Good Roads Machinery Co.
Littleford Bros.
Newport Culvert Co.
Packard Motor Car Co.
Ransome Concrete Machinery Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.
Universal Road Machinery Co.
Warren Bros. Co.
White Co., The.

Road Binders.
Barrett Co., The
Semet-Solvay Co.
Standard Oil Co.

Road Culverts.
Casey-Hedges Co.
Clow & Sons, James B.
Collieries Supply & Equipment Co.
Good Roads Mach'y. Co.
Newport Culvert Co.
Storms Mfg. Co.
U. S. Cast Iron Pipe & Fdy. Co.
Wood & Co., R. D.

Road Drag and Street Scrapers.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
The Good Roads Machinery Co.
Newport Culvert Co.
Rochester Can Co
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Road Oil.
Barrett Co., The
Dustoline for Roads Co.
Standard Oil Co.

Road Oilers.
Austin-Western Road Mchy. Co.
General Motors Truck Co.
Good Roads Machinery Co.,
Universal Road Machinery Co.
White Co., The.

Road Rollers.
Austin-Western Road Machy. Co.
Buffalo-Springfield Roller Co.
Good Roads Machinery Co.

Rock Crushers.
Austin-Western Road Machy. Co.
Good Roads Mach'y. Co.,
Universal Road Machinery Co.
Worthington Pump and Mach. Corp.

Roofing
Barrett Co., The
Carey Co., Philip.

Rubber Tires.—See Tires, Rubber.

Rubbish Burners.
Barnum Iron Works, E. T.

Rust Preventing Material.
Dixon Crucible Co., Jos.
Harrisons, Inc.

Safety Manhole Cover.
East Iron & Machine Co.

Sand Spreaders.
Buffalo Municipal Equipment Co.

Sanitary Drinking Fountains.
Barnum Iron Works
Casey-Hedges Co.
Mott Iron Works, J. L.
Rundle-Spence Mfg. Co.
Stewart Iron Works Co.

Scarifiers.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Good Roads Machinery Co.
Newport Culvert Co.
Universal Road Machinery Co.

Seeds, Plants and Bulbs.
Burpee Co., W. Atlee.
Dreer, Henry A.
Hicks Nurseries.
Storrs & Harrison Co.
Thorburn & Co., J. M.

Service Boxes.
Casey-Hedges Co.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co.

Service Box Finders.
Clark Co., H. W.

Sewage Disposal.
Spray Engineering Co.

Sewage Ejectors.
Otterson Auto-Eductor Co.
Shone Co.

Sewer Brick.
Schuylkill Valley Vit. Prod. Co.

Sewer Buckets.
Champion Potato Machinery Co.
Metropolitan Paving Brick Co.

Sewer Castings.
Casey-Hedges Co.
Clark Co., H. W.
Dee Co., Wm. E.
Enterprise Iron Works.

Sewer Cleaning Apparatus.
Buffalo Municipal Equipment
Champion Potato Machinery
Turbine Sewer Machine Co.

Sewer Jacks.
Ashland Mfg. Co.

Sewer Pipe.
Dee Co., Wm. E.
Sewer Pipe Mfrs. Assn.

Sewer Rods.
Bissell Co., F.
Bond Co., Harold L.
Champion Potato Machinery
Turbine Sewer Machine Co.

Sheer Gates.
Chapman Valve Mfg. Co.
Columbian Iron Works.
Rensselaer Valve Co.

Signs—Iron and Wire.
Barnum Iron Works, E. T.
Buffalo Municipal Equipment
Early, Jos. N.
Lebanon Iron & Machine C
Union Iron Products Co.

Sleeves and Valves.
Flower-Stephens Mfg. Co.
Rensselaer Valve Co.

Sluice Gates and Valves.
Chapman Valve Mfg. Co.
Coldwell Wilcox Co.
Columbian Iron Works
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Rensselaer Valve Co.

Snow Plows.
Baker Mfg. Co.
Good Roads Machinery Co.,
Newport Culvert Co.
Russell Grader Mfg. Co.

Snow Cleaning Machinery
Good Roads Machinery Co.
Russell Grader Mfg. Co.

Soil Pipe (Cast Iron)
Abendroth Bros.
Alabama Pipe & Foundry Co
American Enameling Mfg.
American Foundry & Pipe C
Anniston Foundry Co.
Bessemer Soil Pipe Co.
Campbell Mfg. Co.
Casey-Hedges Co., The.
Central Foundry Co.
Charlotte Pipe and Foundry
Coosa Pipe & Foundry Co.
Crown Pipe and Foundry Co
Gadsden Pipe Co.
Haines, Jones & Cadbury Co
Johnson Co., J. D.
Krupp Foundry Co.
Medina Foundry Co.
National Pipe & Fdry. Co.
Reading Foundry & Supply
Salem Brass & Iron Mfg. Co
Sanitary Co. of America
Somerville Iron Works, The.
Standard Foundry Co.
Superior Mfg. Co.
Union Foundry Co.
Weiskittel & Son Co., A.
Wetter Mfg. Co., H.

Spiral Riveted Pipe.
Casey-Hedges Co.

Spraying Machinery for Tre Shrubs.
Deming Co.

Spray Nozzles.
Spray Engineering Co.

Continued on page 98

THE STANDARD METHOD of SURFACE TREATMENT

Below is a water bonded Gravel Road treated with Stanolind Paving Asphalt at 300°F., 45 pounds pressure, applied one-half gallon to the square yard by special pressure tank wagon shown in other illustration.

One application of Stanolind Paving Asphalt on Macadam and Gravel Roads has given three years' service with practically no expense. Builds more substantial surface at half the cost of light oil treatment for three years. Can be applied on roads previously treated with Road Oil.

Write today for free booklet, "Stanolind Paving Asphalt."

STANDARD OIL COMPANY
(INDIANA)

72 W. Adams Street, Chicago, Ill.

Austin Portable Gyratory Crushers

are the economical solution of many difficulties arising in street, sewer and bridge or building construction; in fact, any job entailing broken stone supply within city limits.

Austin Gyratory Crushers, both fixed and portable types, have been used on such work as New York Subway and Water Tunnels and Chicago city streets to crush old paving blocks and in the water tunnel under Lake Michigan. Their reliable working and excellent construction saved thousands of dollars on these projects of first importance.

Write for catalog.

AUSTIN MANUFACTURING COMPANY - CHICAGO

New York Office—50 Church St.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisers follows this classfied list. See page 100

Standpipes.
Casey-Hedges Co.
Connery & Co., Inc.
Wood & Co., R. D.

Steel Derricks.
Taylor Portable Steel Derrick Co.

Street Cleaning Machines (Motor Driven).
Garford Motor Truck Co.
General Motors Truck Co.
White Co., The.

Street Flushers.
Buffalo Municipal Equipment Co.
Etnyre & Co., E. D.
Garford Motor Truck Co.
General Motors Truck Co.
Good Roads Co.
Sterling Motor Truck Co.
White Co., The.

Street Lamps—Electric.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Street Lamp Posts.
Barnum Iron Works, E. T.
Casey-Hedges Co.
Cutter Co., George.
Electric Railway Equipment Co.
King Foundry Co.
Mott Iron Works, J. L.
Stewart Iron Works Co.

Street and Road Graders.
Adams & Co., J. D.
Austin-Western Road Machy. Co
Good Roads Mach'y Co.
Newport Culvert Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Street and Road Signs.
Baltimore Enamel & Novelty Co
Buffalo Municipal Equipment Co.
Early, Jos. N.
Lebanon Iron & Machine Co.
Union Iron Products Co.

Street Sign Posts.
Casey-Hedges Co.
Cutter Co., George.
Early Jos. N.
Lebanon Iron & Machine Co.
Mott Iron Works, J. L.

Street Sprinklers.
Austin-Western Road Machy Co.
Buffalo Municipal Equipment Co.
Duplex Truck Co.
Etnyre & Co., E. D.
Garford Motor Truck Co.
General Motors Truck Co.
Good Roads Co.
Newport Culvert Co.
Sterling Motor Truck Co.
Water Works Equipment Co.
White Co., The.

Street Sweepers.
Austin-Western Road Machy. Co.
Universal Road Machinery Co.

Street Trash Cans.
American Can Co.
Butler Mfg. Co.
Collieries Supply & Equipment Co.
Rochester Can Co.
Steel Basket Co.

Surveyors Instruments.
Buff & Buff Co.
Kolesch & Co.

Tanks, Storage for Oils and Gasoline.
Bowser & Co., Inc., S. F.
Connery & Co., Inc.

Tanks and Towers.
Casey-Hedges Co.
Newport Culvert Co
Wood & Co., R. D.
Zelnicker Supply Co., W. A.

Tapping Machines.
Water Works Equipment Co.

Tar.
Barrett Co., The

Tar & Asphalt Spreaders
White Co., The.

Tar Kettles.
Casey-Hedges Co
Connery & Co., Inc.
Good Roads Machinery Co.
Littleford Bros.
Warren Bros. Co

Tar Wagons.
Casey-Hedges Co.

Tarvia.
Barrett Co., The

Testing Laboratories.
Allentown Testing Laboratory Co.
Hunt & Co., Rob't. W.

Tires, Rubber.
Dayton Rubber Mfg. Co.
Firestone Tire & Rubber Co.
Goodrich Co., B. F.
Republic Rubber Co.
U. S. Tire Co.

Traction Engines.
Buffalo Springfield Roller Co.

Traction Trains.
Buffalo Springfield Roller Co.

Tractors.
American-La France Fire Engine Co.
Garford Motor Truck Co.
General Motors Truck Co.
Watson Wagon Co.
White Co., The.

Traffic Posts.
George Cutter Co.
Lebanon Iron & Machine Co.

Traffic Regulation Signs.
Baltimore Enamel & Novelty Co.
Buffalo Municipal Equipment Co.
Early, Jos. N.
Lebanon Iron & Machine Co.
Union Iron Products Co.

Trailers.
Buffalo Springfield Roller Co
Watson Wagon Co.

Tree and Flower Bed Guards
Mott Iron Work, J. L.
Wright Wire Co.

Trench Braces.
Bond Co., Harold L.

Trench Pumps.
Bond Co., Harold L.
Deming Co.
Modern Iron Works
Water Works Equipment Co.
Worthington Pump & Mach. Corp.

Turbines.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Vacuum Pumps.
Deming Co.
Worthington Pump & Mach. Corp

Valves.
Ashland Mfg. Co.
Chapman Valve Mfg. Co.
Coldwell-Wilcox Co
Eddy Valve Co.
Flower-Stephens Mfg. Co
Ludlow Valve Co.
Pratt & Cady Co., Inc.
Rensselaer Valve Co.
S E. T. Valve & Hydrant Co.
Water Works Equipment Co
Wood & Co., R. D.

Valve Boxes and Housings.
Casey-Hedges Co.
Clark Co., H. W.
Columbian Iron Works.
Eddy Valve Co.
Flower Stephens Mfg. Co.
Ludlow Valve Co.
Modern Iron Works.
Pratt & Cady Co., Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
U. S. Cast Iron Pipe & Foundry
Wood & Co., R. D.

Valve Seats.
Wood & Co., R. D.

Valve Specialties.
Chapman Valve Mfg. Co
S. E. T. Valve & Hydrant Co

Ventilators.
Ideal Ventilator Co.

Wagons and Carts.
Watson Wagon Co.

Water Works Conservation.
National Water Main Cleaning
Pitometer Co.
Water Works Equipment Co.

Water Main Cleaning.
National Water Main Cleaning

Water Meters.
Badger Meter Mfg. Co.
Buffalo Meter Co.
General Electric Co.
Hersey Mfg. Co.
Neptune Meter Co.
Pittsburgh Meter Co.
Thomson Meter Co.
Union Water Meter Co.
Worthington Pump & Mach. C

Waterproofing.
Barrett Mfg. Co.
Carey Co., Philip
Minwax Co.
Sonneborn Sons, Inc., L.
Trussed Concrete Steel Co.

Water Purification Chemicals
See Chemicals for Water Purific

Water Regulators.
Modern Iron Works
Union Water Meter Co.

Water Towers.
Casey-Hedges Co.

Water Works Specialties.
Casey -Hedges Co.
Chapman Valve Mfg. Co.
Clark Co., H. W.
Flower-Stephens Mfg. Co.
Leadite Co.
Minwax Co.
Modern Iron Works
Pittsburgh Filter Co.
Rensselaer Valve Co.
S. E. T. Valv & Hydrant Co.
Union Water Meter Co.
United Lead Co.
Warren Fdry. & Machine Co.
Water Works Equipment Co.

Well Construction and Equipn
Clark Co., H. W.

Wheel Scrapers.
Adams & Co., J. D.
Austin-Western Road Machy
Good Roads Machinery Co.,

Wire and Cable.
Bissell Co., F.
General Electric Co.
Simplex Wire & Cable Co.

Wire-Cut-Lug Brick.
Metropolitan Paving Brick C
Southern Clay Mfg. Co.

Wood Preservatives.
Barrett Co., The

PENNSYLVANIA
Quality
LAWN MOWERS

THERE are several vital reasons why "PENNSYLVANIA" *Quality* Lawn Mowers have maintained, for over 50 years, their high reputation for easy running, long life and thorough satisfaction.

They are:

—highest grade materials used thoroughout;

—*every* bearing carefully bored and reamed to size;

—*every* blade made of crucible tool steel, oil hardened and water tempered;

—three final inspections insure easy running and positive self-sharpening.

Sold by Hardware Dealers and Seedsmen.

PENNSYLVANIA LAWN MOWER WORKS
JOHN BRAUN & SONS
FOUNDED 1877 PHILADELPHIA

This trade mark is on the handles of:

"Pennsylvania"
"Pennsylvania, Jr."
"Pennsylvania Golf"
"Pennsylvania Putting Greens Mower"
"Continental"
"Great American B. B."
"Shock Absorber"
"Quaker City"
"Red Cloud B. B."
"Orchid B. B."
"Daisy"
"New Belmont"
"Bellevue"
"Panama"
"Delta B. B."
"Electra"
"Pennsylvania Pony"
"Pennsylvania Horse"
"Pennsylvania Grand Horse"
"Pennsylvania Trio Horse" (86 in. cut)

FOOD WILL WIN THE WAR!

Index to Advertisers in this Issue of The American City

Abendroth Bros 21
Adams & Co., J. D 88
Alabama Pipe & Foundry Co..... 21
Albright & Mebus. 77
Allentown Testing Laboratory Co. 77
Alvord, J. W., & C. B. Burdick 77
American Can Co 70
American Cast Iron Pipe Co..... 20
American City Bureau 62
American Enameling Mfg. Corp.. 21
American Foundry & Pipe Co 21
American-LaFrance Fire Eng.Co.. 50
American Nursery Co 74
American Playground Device Co.. 64
Anderson Coup. & Fire Supply Co 60
Andorra Nurseries 71
Anniston Foundry Co 21
Appleton & Co., D 68
Arnold, Hoffman & Co 22
Arnold, Sheffield A 77
Arnold & Tripp 77
Ashland Mfg. Co 65
Atlas Portland Cement Co 15
Austin Western Road Mach'y Co.. 97

Badger Meter Mfg. Co 16
Ballard & Co., F. W 79
Baltimore Enamel and Novelty Co.. 54
Barnes Co., A. S 60
Barnum Iron Works, E. T 61
Barrett Co., The 45
Bessemer Soil Pipe Co 21
Bi-Lateral Fire Hose Co 59
Bissell Co., F 24
Black & Veatch 77
Blanchard, Arthur H 77
Bobbink & Atkins 74
Bond Co., Harold L 26
Bowser & Co. Inc., S. F 58
Bruce-Macbeth Engine Co 25
Buff & Buff Mfg. Co 85
Buffalo Meter Co 33
Buffalo Municipal Equipment Co.. 37
Buffalo Springfield Roller Co 83
Bureau of Municipal Research ... 60a
Burns & McDonnell 77
Burpee & Co., W. Atlee 73
Bush-Beach-Gent 31
Butler Mfg. Co 72

Caird, James M 77
Campbell Mfg. Co 21
Carey Co., Philip 4-5
Casey-Hedges Co 67
Cast Iron Pipe Publicity Bureau . 89
Central Fdy Co 21-23
Champion Potato Machinery Co.. 20
Chapman Valve Mfg. Co 28
Charlotte Pipe and Foundry Co.. 21
Chester & Fleming 77
Clark Co., H. W 33
Clow & Sons, James B 39
Coldwell-Wilcox Co 27
Cole, L. S 77
Columbian Iron Works Co 24
Collieries Supply & Equip. Co..... 83
Connery & Co., Inc 87
Coosa Pipe & Foundry Co 21
Couple-Gear Freight Wheel Co ... 60a
Cravath, J. R 77
Crown Pipe & Foundry Co 21
Cullen, Wm. E 77
Cutter, Geo. Co 101

Davey Tree Expert Co 75
Dayton Rubber Mfg. Co 60
Dee Co., Wm. E 25
Deming Co., The 26
Dixon Crucible Co., Joseph 85
Donaldson Co., (Willadean Nurs.). 74
Dreer, Henry A 76
Duluth Engineering Co 77
Dunham-Clarin Co. F. A. 77
Duplex Truck Co 60
Du Pont Powder Co 81
Dustoline for Roads Co 85

Early, Jos. N 37
East Iron & Machine Co 33
Eddy Valve Co 24
Electric Railway Equipment Co... 43
Electro Bleaching Gas Co 31

Engineering News-Record 40
Enterprise Iron Works 75
Etnyre & Co., E. D 85
Everwear Mfg. Co 10-11

Fabric Fire Hose Co 51
Federal Motor Truck Co 48
Fibre Conduit Co 76
Firestone Tire & Rubber Co 52
Flood, Walter H 77
Flower-Stephens Mfg. Co 26
Ford Meter Box Co 32
Framingham Nursery Co 74
Fuller & McClintock 77

Gadsden Pipe Co 21
Gage, Benj. E 59
Gamewell Fire Alarm T. Co 66
Gannett, Seelye & Fleming 77
Garford Motor Truck Co 41
General Electric Co 2-63
General Motors Truck Co 47
George, Howard 60a
Goodrich Rubber Co., B. F 6-7
Good Roads Co 35
Good Roads Mach'y. Co 91
Great Western Electro Chem. Co.. 31
Greeley, Samuel A 77
Gregory, John H 77

Haines, Jones & Cadbury Co 21
Hansen, A. E 77
Harding James 78
Hare & Hare 78
Harrison Nursery Co 75
Hazen, Whipple & Fuller 78
Helder, Arthur H 78
Hering, Rudolph 78
Hersey Manufacturing Co 22
Hicks Nurseries 72
Higgins, J. Wallace 78
Hill-Standard Co 65
Hopkins, Chas. C 78
Horvath, M. H 78
Hunt & Co., Robert W 79

Ideal Ventilator Co 79

Jacobs, J. L 78
Jaeger Machine Co 82
Jennings, Lawrence & Lindsey 78
Johnson Co., J. D 21
Johnson, Geo A 78

Kimberly, A. Elliot 78
King Foundry Co 37
Kittredge, H. C 78
Knowles, Morris 78
Kohankie & Son, Henry 75
Koiesch & Co 85
Krupp Foundry Co 21

Leadite Co., The 24
Leavitt, Chas. W 78
Lebanon Machine Co 37
Lewis & Valentine 75
Littleford Bros 83
Loper Fire Alarm Co 60
Ludlow, J. L 78
Ludlow Valve Mfg. Co 24
Lynchburg Fdry. Co 20

Manufacturers Dist. Co 76
Marchant Calculating Machine Co. 55
Martinique Hotel 36
Medart Mfg. Co., Fred 64
Medina Foundry Co 21
Meehan Co., Thos. B 73
Meehan, Thos., & Sons 78
Metropolitan Paving Brick Co., The 39
Minwax Co 25
Mitchell, Hugh C 78
Modern Iron Works 31
Mott Iron Works, J. L 55

National Pipe & Foundry Co 21
National Water Main Cleaning Co. 30
Neptune Meter Co 12-13
Newport Culvert Co 89

N. Y. Contin'l Jewell Filtration C
Noiseless Typewriter Co.....
Noll Bros .....
Norwood Engineering Co.....
Nutter, Frank H .....

Otterson Auto-Eductor Co.....

Packard Motor Car Co.....
Pennsylvania Cement Co.....
Pennsylvania Lawn Mower Works
Pennsylvania Salt Mfg. Co.....
Pioneer Asphalt Co .....
Pitometer Co .....
Pittsburgh Filter Mfg. Co.....
Pittsburgh Meter Co.....
Pollock & Taber .....
Potter, Alexander.....
Potts, Clyde .....
Pratt & Cady Co., Inc.....

Reading Foundry & Supply Co..
Rensselaer Valve Co.....
Republic Rubber Co.....
Rigamount, Victor A.....
Rochester Can Co.. .....
Royal Typewriter Co.....
Rundle-Spence Mfg. Co.....
Russell Grader Mfg. Co.....

Salem Brass & Iron Mfg. Co....
Sanitary Co. of America.....
Schuylkill Valley Vit. Prod. Co.
Scofield Engineering Co.....
Semet-Solvay Co.....
S. E. T. Valve & Hydrant Co
Sewer Pipe Mfrs. Assn.....
Shawnee Mower Co.....
Sherman, LeRoy K.....
Shone Co.....
Simplex Wire & Cable Co.....
Smith Co., W. & T.....
Somerville Iron Works, The.....
Sonneborn Sons, Inc., L.....
South Bend Motor Car Works...
Southern Clay Mfg. Co.....
Spaulding Mfg. Co.....
Spray Engineering Co.....
Standard Foundry Co.....
Standard Oil Co.....
Stander, Louis E.....
Steel Basket Co .....
Sterling Motor Truck Co.....
Stewart Iron Works Co.....
Storms Mfg. Co.....
Storrs & Harrison Co.....
Superior Mfg. Co.....

Taylor Portable Steel Derrick Co.
Thomson Meter Co .....
Thorburn & Co., J. M.....
Townsend & Co., S. P.....
Trussed Concrete Steel Co.....
Turbine Sewer Mch. Co.....
Twogood, L. Scott.....

Union Foundry Co.....
Union Iron Products Co.....
Union Water Meter Co.....
United Lead Co.....
U. S. Cast Iron Pipe & Foundry C
United States Tire Co.....
Universal Road Machinery Co..
Utilities Engineering Co.....

Wallace & Tiernan Co. Inc.....
Warren, Engineering Co.....
Warren Bros. Co.....
Warren Foundry & Machine Co.
Washtenaw Engineering Co....
Water Works Equipment Co....
Watson Wagon Co.....
Weiskittel & Son Co., A.....
Westinghouse Elec. & Mfg. Co.
Wetter Mfg. Co., H.....
White Co., The.....
Wiley & Sons, John .....
Wolff, Mark .....
Wood & Co., R. D.....
Worthington Pump and Mch Co
Wright Wire Co.....

Zelnicker Supply Co., W. A.....

pril, 1918
$3 a Year

Publication Office:
Tribune Building, New York

PHILLIPS UNIVERSITY LIBRARY

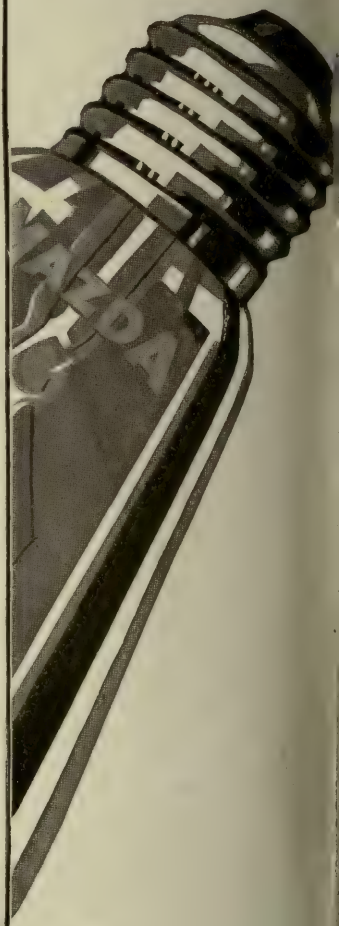
The American City

an fires destroy our supplies, imperil our resources, and weaken our energies 16
ck of American fire losses always stands the greatest contributing factor—A
See "The Great American Bonfire," page 339 in this issue.

MAZDA

"Not the name of a thing, but the mark of a service"

Instead of one manufacturer's spasmodic development of his product, MAZDA Service substitutes a systematic, all-inclusive study of incandescent electric lamps for several manufacturers.



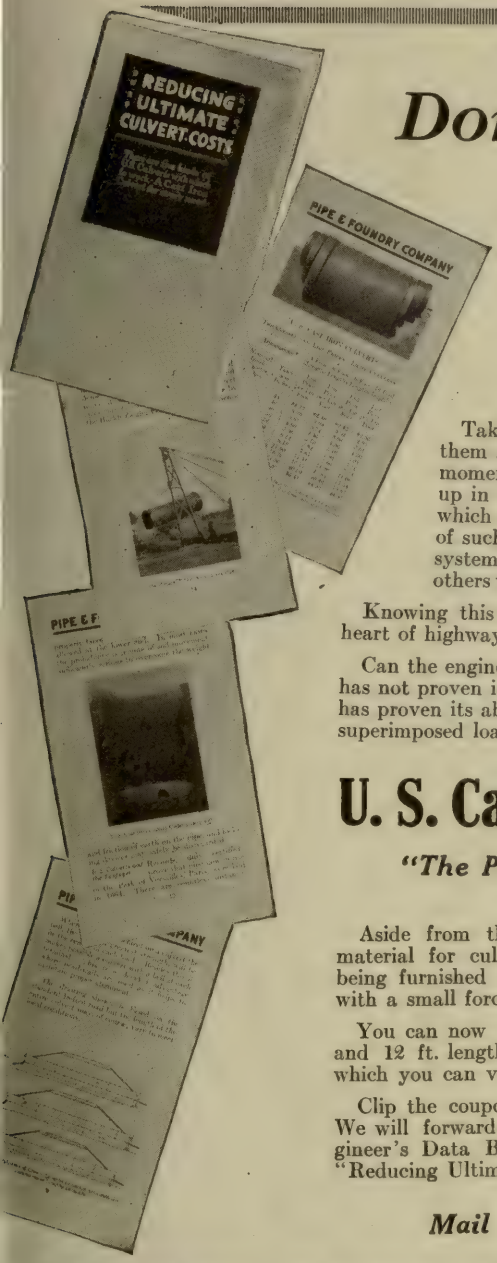
The Meaning of MAZDA

MAZDA is the trademark of a world-wide service to certain lamp manufacturers. Its purpose is to collect and select scientific and practical information concerning progress and developments in the art of incandescent lamp manufacturing and to distribute this information to the companies entitled to receive this Service. MAZDA Service is centered in the Research Laboratories of the General Electric Company at Schenectady.

The mark MAZDA can appear only on lamps which meet the standards of MAZDA Service. It is thus an assurance of quality. This trademark is the property of the General Electric Company.

RESEARCH LABORATORIES OF GENERAL ELECTRIC COMPANY

4628



Don't Delay The War Work

THE road building of this country must continue despite the shortage of labor, because the most vital adjunct to the successful prosecution of the war is a continuous and permanent system of highways.

Take the item of Culverts, for instance. One of them seems unimportant enough until, at the critical moment, it gives way and causes a heavy truck to pile up in the road and delay the delivery of material for which our boys in the trenches are calling. The failure of such a seemingly unimportant part of the highway system not only delays one truck, these days, but many others which follow.

Knowing this to be true, isn't the culvert then the very heart of highway construction?

Can the engineer of today, knowingly, install a culvert which has not proven its ability to last for ages? The culvert which has proven its ability to withstand the attacks of rust, frost and superimposed loads is

U. S. Cast Iron Culvert Pipe

"The Pipe That Outlasts the Ages"

Aside from the fact that cast iron is the one permanent material for culvert construction, U. S. Culvert Pipe is now being furnished in such lengths that it can be installed easily with a small force of men.

You can now secure U. S. Culvert Pipe in 4 ft., 6 ft., 8 ft. and 12 ft. lengths. There are five different wall-thicknesses which you can vary to meet the conditions of the installation.

Clip the coupon at the bottom and forward it TODAY. We will forward to you promptly a copy of our Engineer's Data Book on Highway Construction — "Reducing Ultimate Culvert Costs."

Mail That Coupon Today!

UNITED STATES CAST IRON PIPE AND FOUNDRY COMPANY

700 E. Pearl St., BURLINGTON, N. J.

SALES OFFICES

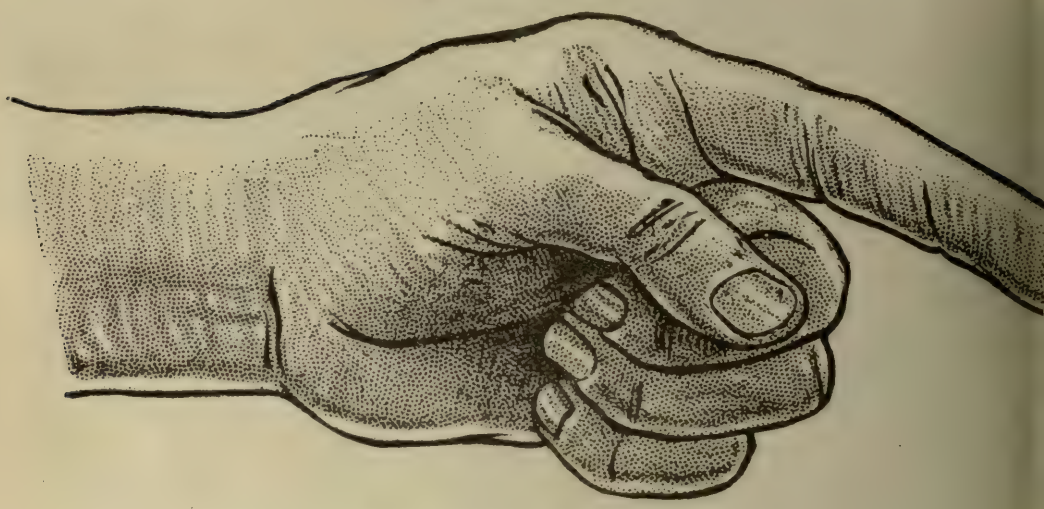
ıiladelphia, 1421 Chestnut St.
ew York, 71 Broadway
ttsburgh, Henry W. Oliver Bldg.
ıicago, 122 So. Mich. Blvd.
St. Louis, Security Bldg.
Birmingham, Ala., Amer. Trust Bldg.
San Francisco, Monadnock Bldg.
Buffalo, 957 E. Ferry St.

Kindly send me a copy of your Engineer's Data Book on Highway Construction—"Reducing Ultimate Culvert Costs."

Name.....
Address.....
City.....

A. C.
4-18

For Index to Advertisements see Page 116
For Classified List of Advertisers see Page 106



BUILT-IN JOINTS
vs.
POURED JOINTS

BUILT-IN—next to the curb, Elastite joints become an integral part of the pavement and keep its surface unified under any and all conditions.

POURED JOINTS cannot be as steadfastly uniform as those built-in. Lacking uniformity, they do not provide for expansion and contraction.

Streets on which Elastite strips are used stay new because they are crack-proof and buckle-proof.

The Philip Carey Company

General Offices: Lockland, Cincinnati, O.

Mt. Vernon Place, Baltimore, on hich Carey Elastite Expansion int was used when the street was ved by the George Long Con- ruction Company in 1912. Today ter nearly six years, the street still in perfect condition.

CAREY

Elastite

NAME REG. U.S. Patent Office

EXPANSION JOINT

Keeps Streets NEW

ELASTITE Expansion strips inserted as the brick is being laid leave nothing to chance.

They are sure to be sufficient for all expansion because they are of exactly known and always uniform thickness, whereas poured joints may be narrow and uneven in spots, causing trouble. They eliminate six-sevenths of the labor required in paving joints.

Carey Elastite consists of a heavy body of special asphalt compound, between two layers of high-grade asphalt felt.

It does not melt in summer nor become brittle and crack in winter. It remains elastic and resilient, adheres to the brick, and wears as long as the pavement itself endures.

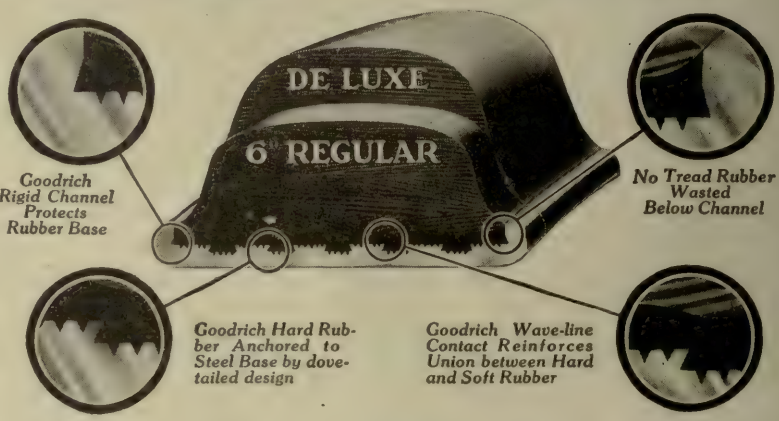
Its merit has been demonstrated on the streets of Philadelphia, Los Angeles, Baltimore, Des Moines, Nashville, Cincinnati and other leading cities in the United States and Canada. Ask for particulars. For complete information and literature address

THE PHILIP CAREY CO.

8 Wayne Ave. Lockland, Cincinnati, O.

DE LUXE

EXTRA THICKNESS **VELVET MILEAGE**



Vibration Problem Solved!

By actual test, the *cushioning qualities* of Goodrich De Luxe Truck Tires are 50% greater than in regular tires of corresponding widths.

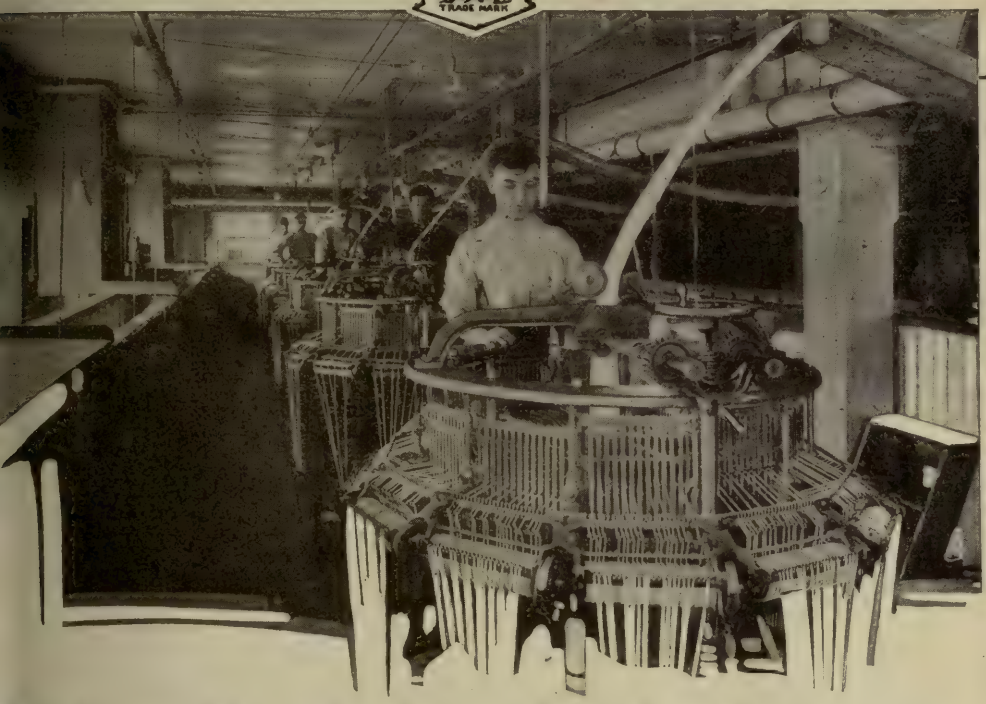
The greater heights of tread rubber mean ***truck insurance plus tire economy.***

You can readily see why De Luxe Tires ***must*** reduce repair costs, lessen depreciation, prevent truck lay-ups and prolong truck life.

Goodrich De Luxe Truck Tires outclass ordinary tires in thicker tread at the start; in velvet mileage at the end. Get them at any Goodrich Service Station.

THE B.F. GOODRICH RUBBER COMPANY
AKRON, OHIO

GOODRICH
Truck Tires



Medium Priced—Long Lived—Distinctive

"WHITE KING"
FIRE HOSE

eventually is the choice of the fire chief who is conscientiously searching for true quality.

Because—

There is not a better, more dependable cotton jacketed Fire Hose on the market today—*regardless of type, style or price* than "WHITE KING." This guarantee is embodied in every bid.

Thousands of fire chiefs, from coast to coast, know it—and a torrent of re-orders prove it.

Let "WHITE KING" prove itself to you.

THE B.F. GOODRICH RUBBER COMPANY

Makers of the Celebrated Goodrich Automobile Tires—
"Best in the Long Run"

Akron, Ohio—The City of Goodrich

REVEALED BY THE DRAFT

Noting the large number of rejections under the selective draft physical unfitness traceable to malnutrition and underdevelopment, the S. Health Service urges a national program of cooperation with state, cou and municipal authorities in an attempt to eradicate the causes of th defects.

One recommendation especially emphasized as tending to the devel ment of sound and healthy bodies in the rising generation is the more gen use of playgrounds.

Every city can afford playgrounds. The initial cost is not great, the upkeep expense is nominal—if you install the *right* apparatus at start. Most cities have found that Everwear is the *right* apparatus. I strong, durable, up-to-date and safe. Money spent for Everwear appara is always well spent.

Write for Catalog J 6 and photographs.

THE EVERWEAR MFG. CO.

SPRINGFIELD, O.

EVERWEAR
STANDS WEAR AND TEAR

DO IT RIGHT OR NOT AT ALL!

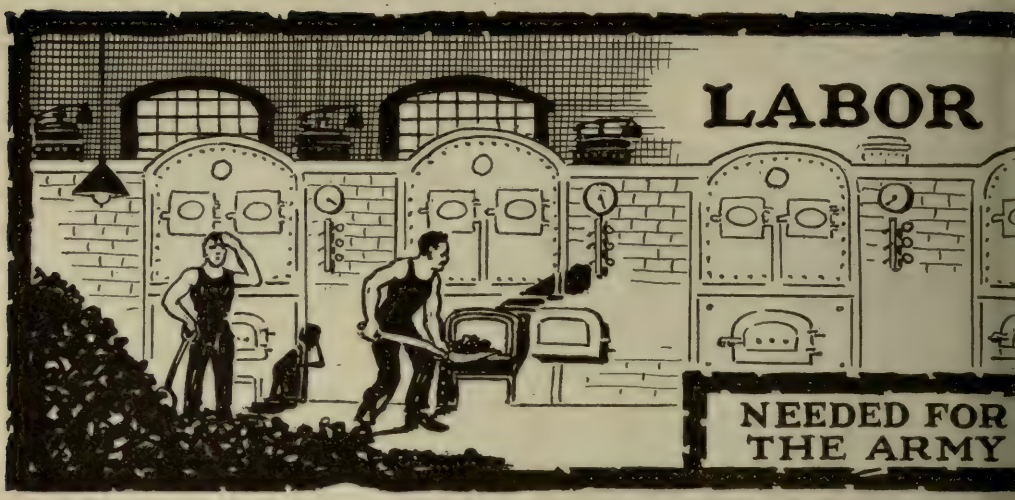
Unless playground equipment is made of high grade material and by pert mechanics, it will do more harm than good. Poor apparatus breaks sily and causes serious injury to the children. You surely do not want to end money for that kind of apparatus, or for apparatus that requires nstant repairing. If you are going to equip playgrounds—*do the job ht.* Buy the apparatus that has been chosen by the majority of other ies—EVERWEAR APPARATUS. With Everwear Equipped play-ounds, *you* are safe and the *children* are safe. Everwear Equipment is ade of heavy galvanized steel and wood parts of rock maple—equipped th malleable frame fittings and forged steel parts.

A complete line of the latest and most approved style of playground paratus is shown in Catalog J 6 which will be sent free to anyone interested building up a better and healthier American Citizenship.

THE EVERWEAR MFG. CO.

SPRINGFIELD, O.

EVERWEAR
STANDS WEAR AND TEAR



What The Citizen Can Do

"Every citizen in this country should make sure that he is not wasting any water in his household. Wasting includes permitting the water to run unduly for purposes of refrigeration and permitting a small leak to continue for weeks when by stopping it at once the householder will save money for himself, his city and his country. In cities which are not metered the householder is not really sure whether he is using less water this month than last. If he lives in a city which meters all or most of the water used, he can check up his consumption and find whether he is doing his share in the community saving by using less Water."

"Labor, coal and machinery are needed for the prosecu= tion of the War more than for pumping water for excessive consumption. Is your water supply conserved by water meters? If not, why not?"

NEPTUNE METER COMPANY
50 EAST 42nd STREET, NEW YORK
CHICAGO · BOSTON · SANFRANCISCO
ATLANTA · LOS ANGELES · PORTLAND · SEATTLE
CINCINNATI

What The City Can Do

"Municipal patriotism can be shown in more ways than one. The fiery, noisy kind seen on the Fourth of July is one type, the enthusiastic send-off of the boys in the National Army is a second. There is, however, a brand of patriotism that does not show on the surface and that does not appeal to the ear. When the War is over and everyone is taking account of stock, the city that has quietly investigated its own weaknesses, reduced its own expenses judiciously, looked into the reasons for the *excessive use of water*, and has finally taken steps to eliminate the trouble even at considerable expense—this city will be among those whose names are on the honor roll of the nation."

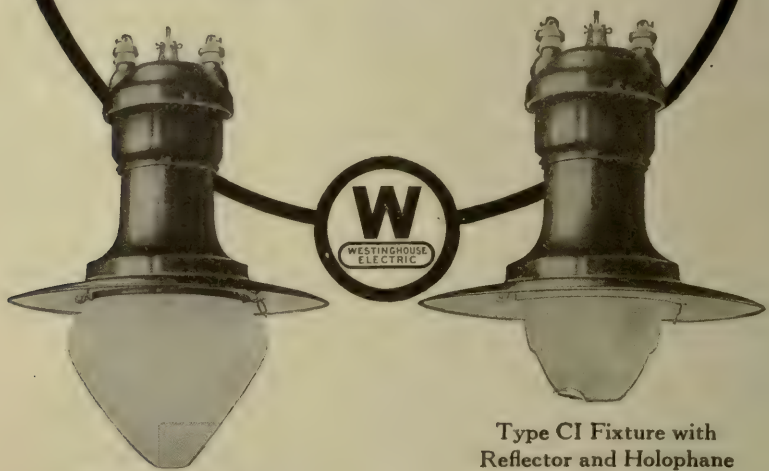
If you would like to receive free of charge several interesting booklets showing how to prevent the needless waste of water in your city, and the unnecessary wear and tear of your water works equipment, just send us your address.

NEPTUNE METER COMPANY
50 EAST 42nd STREET, NEW YORK
CHICAGO · BOSTON · SANFRANCISCO
ATLANTA · LOS ANGELES · PORTLAND · SEATTLE
CINCINNATI

Westinghouse

Type CI (Cast Iron) Luxsolite Fixtures For Mazda C Lamps

The cast-iron case makes them particularly adaptable to the hard service required of street-lighting fixtures—the cast-iron case cannot be dented.—It is finished with black asphaltum paint. Such fixtures installed under the most severe climatic conditions, have given four years of service without showing any appreciable deterioration. The cases are very convenient to disassemble, sherardized bolts being used throughout. The overall weight of the fixture has been kept well under that of standard arc lamps, thus no difficulty is experienced in the use of the same line equipment with Type CI Luxsolite Fixtures.



Type CI Fixture with Reflecter and Large Globe

Type CI Fixture with Reflector and Holophane Skirted Refractor

Westinghouse Electric & Manufacturing Co.

East Pittsburgh, Pa.

Sales Offices in All Large American Cities

"W & T" Service

OUR engineering staff is always ready to give expert advice in all problems on Water and Sewerage Disinfection.

Our erecting staff is always ready for field service, whether connected with new installations or with the maintenance of existing apparatus.

Our whole organization is constructed with a view of instant and complete service to all of our clients.

Wallace & Tiernan Service on all of the more than 500 installations has been highly endorsed. We stand ready to serve you equally well.

Is your name on our mailing list?

Wire or Phone

Wallace & Tiernan Co.

INCORPORATED

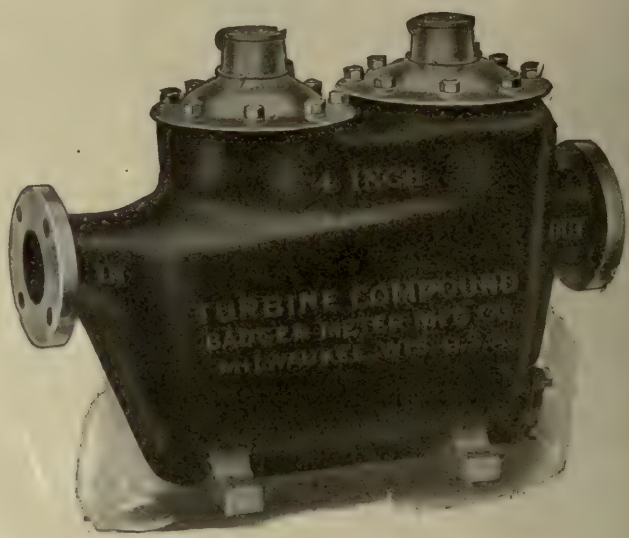
137 Centre St., New York

Canadian Representatives
THE GENERAL SUPPLY COMPANY
OF CANADA
Ottawa, Montreal, Toronto, Winnipeg

Chicago Office:
People's Gas Building

Pacific Coast Representative
KENNETH SHIBLEY
Merchants' Exchange Building
San Francisco, Cal.

The Meter that gives absolute satisfaction is the BADGER



THE BADGER

Gives Most Service and Least Trouble

The water meter that will keep accurate records and give the most service with little trouble and maintenance expense is the Badger Meter.

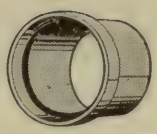
Perfect workmanship and excellent finish are characteristic of all Badger Meters.

Every Badger Meter is carefully tested by actual operation before it is sent forth with our binding guarantee for accuracy.

No test is considered satisfactory until the meter has properly recorded on both large and small flows.

Upon receipt of your name and address, a neat little booklet on water meters will be sent you free.

The Badger Meter Mfg. Co.
MILWAUKEE, WIS.



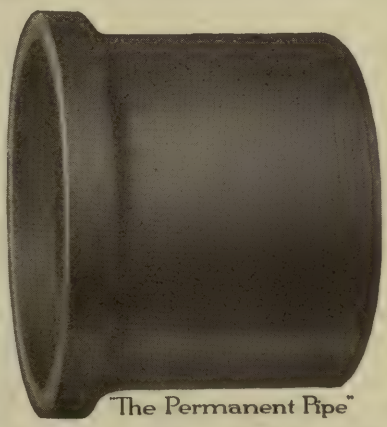
Broken Pipe, Certainly— but *Listen*

WHEN a product is plainly in a damaged condition we dislike to plead an "alibi." But the fact is that this particular pipe was conducting the "Waters of Babylon" long before the tearful days of the Hebrew captivity. In Ninevah, in Ur of the Chaldees and other cities of early Mesopotamia pipes of burned clay were doing duty 4,000 years ago and more. We cannot equal their service records, today, because America is not old enough but we can and do make better pipe.

Vitrified Clay Pipe
"THE PERMANENT PIPE"

UNEXCELLED FOR

Municipal sewers
Underdrainage of highways
Enclosed side drainage
Culvert barrels

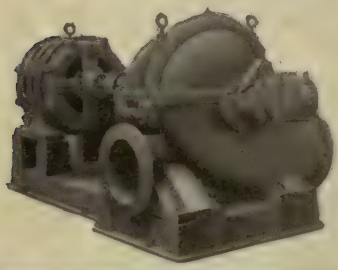


THE SEWER PIPE MANUFACTURERS' ASSOCIATION
JOHN L. RICE
D COMMISSIONER
SECOND NATIONAL BLDG
AKRON, OHIO

WORTHINGTON

a big line to choose from—a safe line to choos

WORTHINGTON
CENTRIFUGAL PUMPS



Increased efficiency and lower coal costs

The fuel crisis furnishes to water works m a sharp reminder to cut every form of wa and inefficiency.

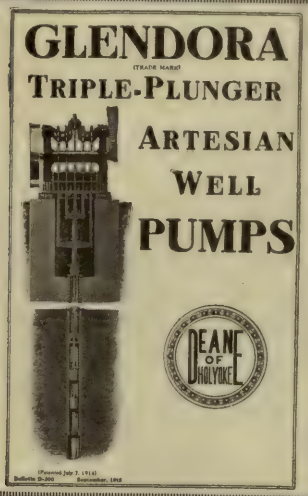
Those Municipalities whose water works cons of Worthington Pumps find in the midst of t present coal situation, at least the one satisfyi element that their pumping equipment is ope ating with the highest economy of fuel.

Bulletins covering any or all types of pumps, sent on request.

WORTHINGTON PUMP AND MACHINERY CORPORATION

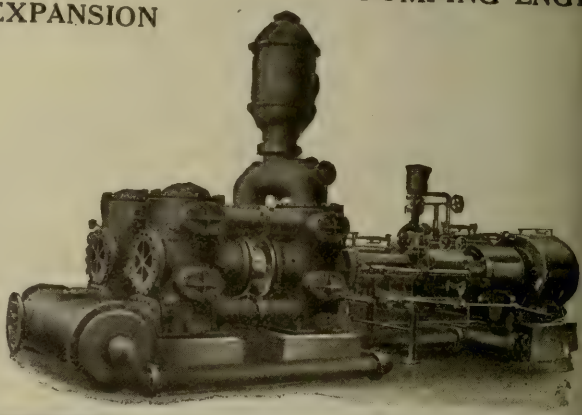
115 BROADWAY, NEW YORK

Branch Offices in all Principal Cities. I 5



WORTHINGTON
TRIPLE
EXPANSION

WATER WORK
PUMPING ENGIN



WATER WORKS PUMPS

CAST IRON SOIL PIPE

LASTS LONGER THAN THE BUILDING—*ANY BUILDING*

THE PIPE EVER-LASTING

NEW USINESS OME_

ilt to last_To af-
rd permanent ser-
ce_To have ideal
nitary conditions.

CAST IRON
SOIL PIPE

stalled,_knowing it will
itlast the building. Used
roughout to insure per-
anent service. Specified to
event unsanitary conditions.

ANITATION, ECONOMY,
ERMANENT SERVICE

IN THE BUILDING UNDER THE GROUND

Madison Ave. & 40 St., New York
Starrett & Van Vleck *Architects*

ications and literature will be mailed upon request by any or all of the following independent and competing makers of Cast Iron Soil Pipe and Fittings

ttel & Son Co., A.	Baltimore, Md.	Campbell Mfg. Co.	Gadsden, Ala.	Haines, Jones & Cadbury Co.	Philadelphia, Pa.
r Mfg. Co., H.	Memphis, Tenn.	Casey-Hedges Co., The	Chattanooga, Tenn.	Johnson Co., J. D.	New York, N. Y.
eath Brothers	Port Chester, N. Y.	Central Foundry Co.	New York, N. Y.	Krupp Foundry Co.	Lansdale, Pa.
ea Pipe & Foundry Co.	Anniston, Ala.	Charlotte Pipe & Foundry Co.	Charlotte, N. C.	Medina Foundry Co.	Medina, N. Y.
ron Foundry & Pipe Co.	Pennsylvania, Pa.	Coosa Pipe & Foundry Co.	Birmingham, Ala.	National Foundry Co. of N. Y., Inc.	Brooklyn, N. Y.
ton Foundry Co.	Anniston, Ala.	Crown Pipe & Foundry Co.	Jackson, Ohio	National Pipe & Foundry Co.	Attalla, Ala.
ow Soil Pipe Co.	Bessemer, Ala.	Gadsden Pipe Co.	Gadsden, Ala.	Reading Foundry & Supply Co.	Reading, Pa.
Salem Brass & Iron Mfg. Co.	Salem, N. J.
Sanitary Co. of America	Linfield, Pa.
Somerville Iron Works	New York, N. Y.
Standard Foundry Co.	Anniston, Ala.
Superior Mfg. Co.	Bessemer, Ala.
Union Foundry Co.	Anniston, Ala.

A-1041

IT'S EASY-

There is nothing magical about the cleaning of a water main. In fact it is very simple when done by

The National Method

Don't you know that a clogged main puts both life and property in the hands of chance? A clogged main is an ideal breeding place for all kinds of disease germs, and therefore endangers the health of your citizens.

A clogged main retards the flow of water and in case of fire is a serious handicap.

Why not have your mains cleaned, it's much cheaper than to relay new pipe?

You don't buy a new smoking pipe when your old one becomes clogged with bits of tobacco—no—you clean it. The same thing applies to water mains—clean them.

Write for free booklet "The Cleaning of a Water Main."

National Water Main Cleaning Co.

Hudson Terminal Building

NEW YORK CITY

CHAPMAN VALVES and ACCESSORIES

Everything for Water Works and Sewage Disposal but the Pipe.

Corporation and Curb Cocks.

Goosenecks—made up with Anderson couplings which eliminate wiped joints.

Gate Valves
Sluice Gates
Hydrants

Catalogue containing valuable information free on request.

Write Today

THE CHAPMAN VALVE MFG. CO.
Indian Orchard, Mass.

KEEP YOUR METER OUT OF THE REPAIR SHO

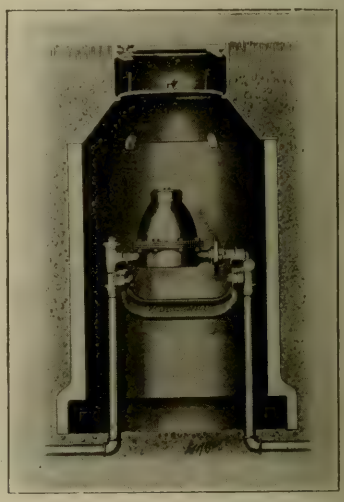
FORD METER BOXES will help to keep your meters out of the repair shop by protecting and safeguarding the delicate mechanism from the destroying hands of Jack Frost and human meddlers.

Ford-Boxed meters can't freeze because they are protected by earth's heat and an air-tight cover.

Ford Meter Box Covers come off only for the meter readers, thereby putting an end to the "not-at-home" delayed readings.

Ford Meter Boxes mean ABSOLUTE PROTECTION—nothing more—nothing less.

Let us send you circular matter telling you more about the Ford Meter Box and how it can save your water department some real money.



THE FORD METER BOX CO.
WABASH, INDIANA

The Pipe that Answers All Questions

STANDARD SIX FOOT LENGTHS LAID WITHOUT CALKING OR GASKETS.

BECAUSE——————

That is why it is used for—

WATER
GAS
SEWAGE DISPOSAL
SUCTION
OIL DISTILLATION
REFRIGERATION
LOW-PRESSURE STEAM
CENTRAL STATION HEATING
DYE AND ACID DRAINS

-and all other classes of service—in buildings—under ground.

CAST IRON PIPE is the pipe of long life—THE PIPE EVERLASTING.

CAST IRON PIPE with the UNIVERSAL JOINT STAYS when other pipe and other joints leak.

Tested and approved for Fire Protection Service by the National Board of Fire Underwriters.

Wrenches the Only Equipment

—no packing
—no calking
—no gaskets

UNIVERSAL PIPE can be laid anywhere—at any time—under any conditions.

CORRESPONDENCE INVITED.

CENTRAL FOUNDRY COMPANY

CHICAGO
DALLAS

NEW YORK
90 West Street

ATLANTA
SAN FRANCISCO

U-246

SEWAGE DISPOSAL

A Bibliography of the

ACTIVATED SLUDGE PROCESS

of sewage treatment gladly sent upon request

GENERAL FILTRATION COMPANY, INC.

CUTLER BUILDING ROCHESTER, N. Y.

SLUICE GATES, CHECK VALVES, AIR VALVES, INDICATOR POSTS, ETC.

GATE VALVES **EDDY** FIRE HYDRANTS

Hydraulically and Electrically Operated Valves and Sluice Gates. Valves Designed For All Kinds of Service

EDDY VALVE COMPANY, WATERFORD, N. Y.

New York Chicago Boston San Francisco Philadelphia

COLUMBIAN IRON WORKS

CHATTANOOGA, TENN.

Manufacturers of Fire Hydrants, Valves, Valve Boxes, Sluice Gates, Meter Boxes and Water Works Supplies

ESTIMATES PROMPTLY FURNISHED

The Best Material for CALKING Joints in Cast Iron Pipes is

Ulco Lead Wool

Write for particulars to

UNITED LEAD COMPANY

111 BROADWAY, N.Y. CITY

Trade **LEADITE** *Mark*

Registered U. S. Patent Office

For Jointing Cast Iron Water Mains

NO CAULKING required

Saves 50% to 65%

Write for information and price

THE LEADITE COMPANY, Inc.

100 S. Broad Street Philadelphia, Pa.

FIRE HYDRANTS

Frost-Proof

Simple-Efficien

All parts removable without digging up hydrant. Special device prevents street from being flooded should stand pipe be broken. Minimum expense to install and maintain.

LUDLOW

GATE VALVES

FOR

Water, Steam

Gas, Oil, Hydrauli

or Electric Operated

All styles, any size, all pressure

- - THE - -

Ludlow Valve Mfg. Co

TROY, N. Y.

Branch Offices

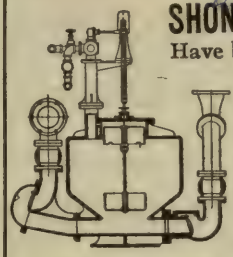
New York Chicago Boston Philadelphia Pittsburg Kansas City

TRADE MINWAX MARK

THE PERMANENT
WATERPROOFING

Used on notable municipal works the country over. Send for the "Minwax" Bulletins describing waterproofing and protective products for every purpose.

THE MINWAX COMPANY, Inc.
18 EAST 41st STREET NEW YORK



SHONE SEWAGE EJECTORS

Have been used for pumping city sewage in all parts of the world for over 35 years.

Unequalled for reliability, economy and durability.

Automatic and odorless.

Send for Bulletin P 4000

SHONE COMPANY
225 Institute Place, CHICAGO

Manufacturers of CAST IRON PIPE

for WATER—GAS—CULVERTS—SEWERS

Special Castings:-Also Flexible Joint Pipe-Cylinders-Tubes, Milled and Plain Ends-High Pressure Fire Service Pipe.

"Quality and Service Guaranteed"

WARREN FOUNDRY & MACHINE CO

Sales Offices: 11 Broadway, N.Y. 201 Devonshire St., Boston, Mass.
Works: Phillipsburg, N. J.

MICHIGAN
PRODUCTS

Fire Hydrants
Gate Valves
Sluice Gates
Check Valves
Foot Valves
Shear Valves
Tide Valves
Sleeve Valves
Tapping Machines
Indicator Posts
Valve Boxes

FLOWER-STEPHENS MANUFACTURING COMPANY
103 Parkinson Street, Detroit, Mich.

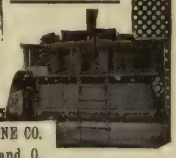
NEW YORK CHICAGO
Keystone and Eureka
Water Meters
Pittsburgh Meter Co.
East Pittsburgh, Pa.
LOS ANGELES SEATTLE
KANSAS CITY

Power with Less Coal

Now more than ever before is it good business for the individual industrial plant to operate power and light equipment with the least possible fuel, owing to the present high cost of coal.

Furthermore it has been demonstrated that it is a necessity for industry as a whole to reduce the total consumption of fuel to the lowest possible point.

It is a recognized fact that Gas Power Plants operate on far less fuel than any other form of power plant.

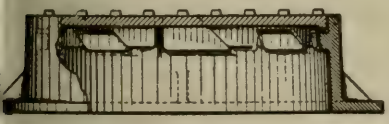


THE BRUCE-MACBETH ENGINE CO.
2137 Center St. N. W., Cleveland, O.

P&C CO VALVES & HYDRANTS P&C CO

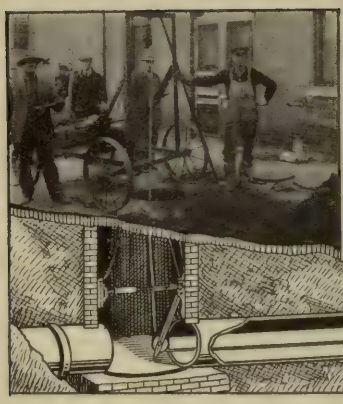
of UNUSUAL QUALITY — for UNUSUAL SERVICE

Pratt & Cady Co., Inc. Write for Catalogue Hartford, Conn.



WM. E. DEE COMPANY
80 N. La Salle Street Chicago, Ill.

We manufacture Manhole, Catch Basin and Sewerage Castings of all Kinds. We make anything in Gray Iron. Write for our prices.



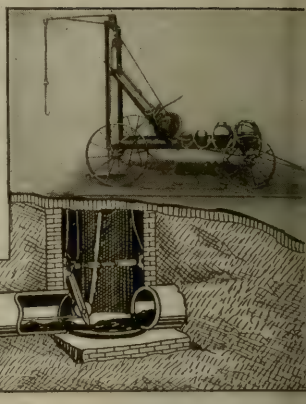
SEWER CLEANING MACHINERY

The Kuhlman Sewer Cleaning Apparatus will clear any sewer of dirt, gravel, sand, cinders, rags, paper, tar or practically anything.

It does the work quickly and cheaply. It's a great time and money saver. It is being utilized by scores of progressive municipalities all over the country.

Write at once for prices and other interesting information. We also make sewer rods. Send for free sample.

The Champion Potato Machinery Co.
338 Sheffield Ave. Hammond, Ind.



AMERICAN CAST IRON PIPE CO.

MANUFACTURERS OF CAST IRON PIPE & FITTINGS BIRMINGHAM, ALA.

SALES OFFICES
Birmingham, Ala., Box 908
Columbus, Ohio, 607 New Hayden Bldg.
Minneapolis, Minn., 712 Plymouth Bldg.
New York City, No. 1 Broadway
Chicago, Ill., 512 1st National Bank Bldg.
Dallas, Tex., 1217 Praetorian Bldg.
Kansas City, Mo., 716 Scarritt Bldg.
San Francisco, Cal., 711 Balboa Bldg.

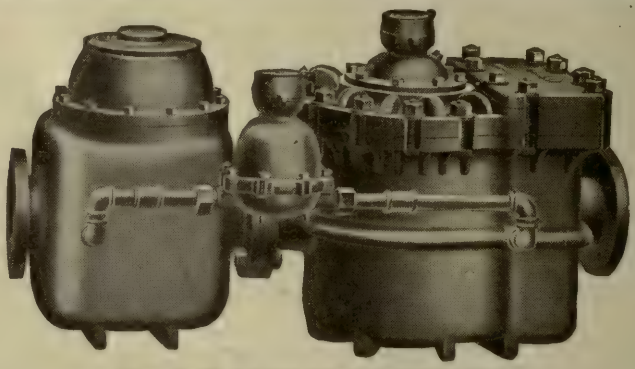
"RENSSELAER" VALVES
All Sizes All Pressures All Purposes

"COREY" FIRE HYDRANTS
Valve Boxes Indicator Posts Air Valves

RENSSELAER VALVE CO.

General Offices, TROY, N. Y.

NEW YORK, Hudson Term. Bldg. CHICAGO, Monadnock Block PITTSBURGH, Oliver Bldg. SEATTLE, Arctic Bldg.
LOUISVILLE, Starks Bldg.



Compounding Valve Attached to Nilo Meter

The Union Compounding Valve Makes it Possible for any Large Meter to Register the Trickle as well as the Rush.

Simply take the valve and the small meter and attach them to the large meter, and you have an accurate and simple compound meter at a remarkably low cost.

Write for further information.

UNION WATER METER CO.

WORCESTER, MASS.

MATHIESON ALKALI WORKS, Inc.

Niagara Falls, N. Y.

Castner Electrolytic Process

Eagle-Thistle Brand

CHLORIDE OF LIME

In 200, 450 and 750-lb. drums
Strongest, quickest-settling, most reliable.

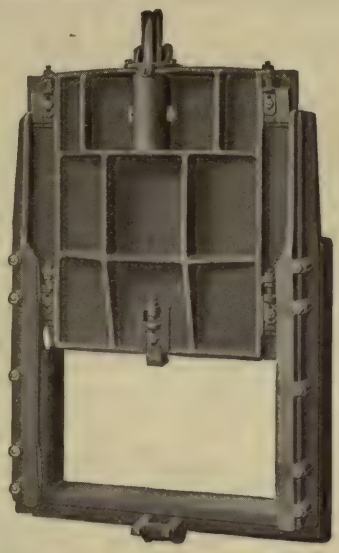
LIQUID CHLORINE

Pure anhydrous, for use with any control apparatus. In improved and convenient cylinders, 105 and 150 lbs. net.

ARNOLD, HOFFMAN & CO., Inc.

Sole Agents

Boston, Providence — 61 Broadway, New York — Philadelphia, Charlotte, N. C.



Sluice, Head and Penstock Gates
Flap and Shear Valves

The kind that don't wear out

COLDWELL, WILCOX COMPANY

Water Street — Newburgh, N. Y.

APPROVAL

HERSEY DETECTOR METER

The Hersey Detector Meter has been accepted for eleven years in 3", 4", 6", 8", 10" and 12" sizes without any restrictions or conditions of any kind by every Insurance Company, Stock and Mutual, doing business in the United States, and by the Water Departments and Water Companies in more than 500 Cities and Towns for use on over 3,000 Fire Services protecting nearly $2,000,000,000 worth of Insured Property.

HERSEY MANUFACTURING COMPANY

BOSTON, NEW YORK, CHICAGO — COLUMBUS, O., PHILADELPHIA, ATLANTA — SAN FRANCISCO, LOS ANGELES, PORTLAND, ORE.

The MANOGRAPH

Unequalled for

Simplicity and Accuracy

The MANOGRAPH is the only pitot recorder in which there are no complicated or invisible working parts.

Open the door and all working parts are exposed for inspection.

No springs, floats, diaphragms, cams, cables or other complicated and delicate mechanisms to get out of adjustment.

The MANOGRAPH may be checked and corrected for accuracy instantaneously.

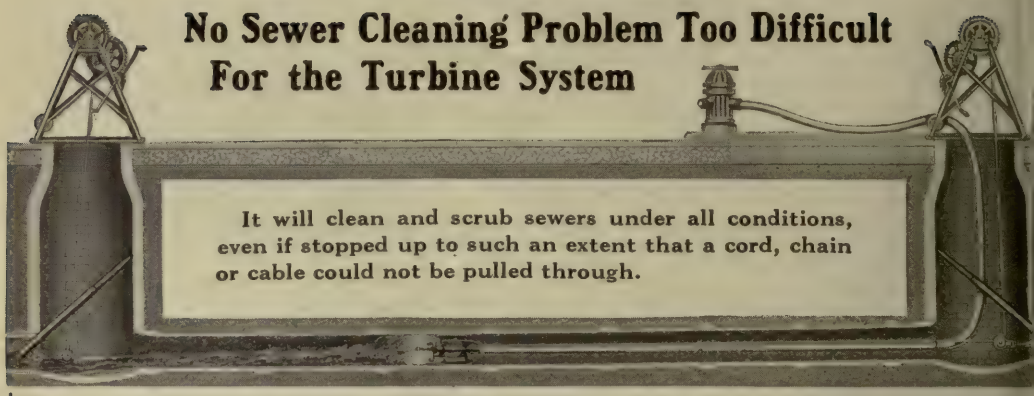
These features are exclusive and make the MANOGRAPH the simplest and most accurate of all pitot recorders.

A bulletin descriptive of the MANOGRAPH may be obtained from

Water Works Equipment Co.

50 Church Street — New York City

No Sewer Cleaning Problem Too Difficult For the Turbine System



In partially clogged sewers the Turbine is drawn through by means of cable and windlasses. If completely clogged, the Turbine Forcing Jack is used in forcing an opening through the stoppage. Roots, grease, tar and other resisting materials have been easily moved.

Write for "Sewer Cleaning Equipment"

Turbine Sewer-Machine Company

Incorporated

197 11th Street, Milwaukee, Wis.

Modern Water Works Tools

are saving time, labor and money for Water Departments in all parts of the World. Our products have a reputation for simplicity, reliability and workmanship. The following are included in our extensive line:

ECONOMIC LEAD FURNACE.
Prevents lead wastage; no ladling; used directly on pipe.

LEAD JOINT REMOVER.
Removes lead without damage to pipe, valves or plugs in fraction of usual time.

CORPORATION TAPPING MACHINE.
Lightest in weight, and most reasonable in cost of any similar machine on the market.

PIPE CUTTING MACHINE.
Made in various sizes, each to cut at least three sizes of pipe. Leaves a perfectly smooth edge.

HIGH PRESSURE FIRE HYDRANT.
Used in nearly every city having a high pressure fire system. We make all types of hydrants for all kinds of service.

VALVE INSERTING MACHINE.
Inserts valves in pipe lines without interfering with the flow or pressure. Simple in operation.

TAPPING APPARATUS.
The original method of connecting mains without shutting off pressure. Extensively used.

CALKING MACHINE.
For use on mains 24 inches and up. Operated by steam or compressed air. Makes a solid joint in less time.

We also manufacture a complete line of brass goods and valves for every purpose.

Write for descriptive literature

The A.P. Smith Mfg. Co., East Orange, N.J.

**"Let those now love who've never loved before,
And those who always loved now love the more."**

LAMBERT WATER METERS

Long Life. **All parts interchangeable.**
Lasting Accuracy. **Maintenance cost nominal.**

Their merits have made meter systems popular. A good article is always worth the price. All improvements which the tests of time and long service show to be requisite in a **Perfect Water Meter** are embodied in the **Lambert.**

ONE MODEL ONLY

Made in all sizes, ⅝" to 6", of best bronze Composition throughout, fitted with Unbreakable reinforced disc-pistons.

Illustrated Price List on Application. Address Dept. C.

THOMSON METER CO.

100-110 BRIDGE ST., BROOKLYN, N.Y.

Chemicals for Water Purification

We manufacture highest grade of

Sulphate of Alumina

also

Chloride of Lime

Liquid Chlorine

PENNSYLVANIA SALT MFG. CO.

WIDENER BLDG. :: :: PHILADELPHIA, PA.

R.D. Wood & Co.

PHILADELPHIA, U. S. A.

ENGINEERS
IRON FOUNDERS
MACHINISTS

Pipe, Hydrants, Valves, Gas Producers, Pumps, Gas Work Materials

Filtration Plants

for

Municipal Needs

Y. M. C. A's, Colleges and all Institutions

Write for Booklet

NORWOOD ENGINEERING CO.
Florence Mass.

GREAT WESTERN ELECTRO CHEM CO.
BUSH, BEACH & GENT
SOLE AGENTS
CARBON TETRACHLORIDE
POTASSIUM CHLORATE
BLEACHING POWDER
LIQUID CHLORINE
CAUSTIC SODA
SAN FRANCISCO, CAL.

A Contract is a Contract

80 Maiden Lane
NEW YORK

Holbrook Building
SAN FRANCISCO

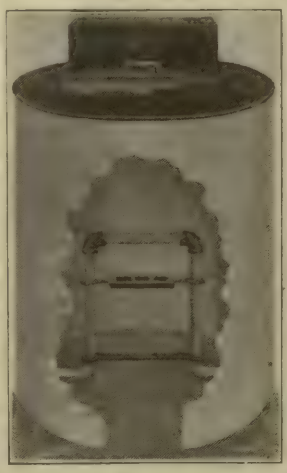
LIQUID CHLORINE

CHLORIDE OF LIME
(Bleaching Powder)

—SODA ASH—

ELIMINATE WASTE OF MONEY AND LABOR!!!

Every Water Meter frozen this past Winter called for an unnecessary expenditure of both. It is not enough to Conserve by simply installing Meters—they must be properly Housed.
"MODERN" METER HOUSINGS—Improved TOPS with Inner Lids and Simplified CONNECTIONS have proven their EFFICIENCY through actual Demonstration.
They Protect the Meter — eliminate loss through Service Leakage—are lowest in first cost—easiest to install and operate. If interested in more Efficient Meter Installations, send for samples or more detailed information.



MODERN IRON WORKS
Manufacturers and Distributers
Improved Meter Housings and Connections—Service and Valve Boxes—Brass Goods—Pipe Derricks—Water Works Gages—Special Castings and other Water Works Supplies.
510 OHIO ST., QUINCY, ILL.

PURE
Liquid EBC Chlorine
INSURES PURE DRINKING WATE

And the cost is so trifling. Just think—for 2c a year per capita you insure every man, woman and child in your town against the ravages of typhoid and other water-borne disease.

Write for free book—"THE WISE CITIES"—It tells why.

Electro Bleaching Gas Compa
16 E. 41st St. New York (

AMERICAN AND NIAGARA

WATER METERS

WRITE FOR LITERATURE BELOW

WRITE FOR TRIAL METER

WATER METER RATES AND REGULATIONS
ADVANTAGES OF USING WATER METERS
MODEL WATER METER SPECIFICATIONS
FACTS AND FIGURES ABOUT OUR METERS IN SERVICE
AMERICAN AND NIAGARA WATER METERS
WATER METER ACCESSORIES
SETTING AND TESTING WATER METERS
PRICE LIST WATER METERS AND ACCESSORIES

ADJUSTABLE MANHOLE TOP

An Adjustable Manhole Top with a cover which stays in place and does not Rattle.

Especially adapted to meet the strenuous requirements of varying grade changes and surface wear—incident to heavy and mixed traffic.

Notwithstanding general shortage of materials and difficulties of transportation. We can make PROMPT SHIPMENTS.

Write us for detailed information.

J. E. T. VALVE & HYDRANT COMPANY
Hudson Terminal Bldg., New York City

PIVOT LOCK COVER

SAFE, ECONOMICAL and SANITARY
Write for details
THE EAST IRON AND MACHINE CO., Lima, O.

ORIGINAL

OF COURSE WE HAVE IMITATORS
YOU KNOW WHY—

The Clark Meter Box has *made good* in 25 years of actual service. Thousands of water departments use it. No other "*Just As Good*" Can't Be. Prices are the lowest. Quick delivery. Other Clark Goods are in same class.

Trade Mark

H. W. CLARK CO.
130 So. 17th St., Mattoon, Ill.
Everything for the Water Works
New York — Salt Lake City
San Francisco — Chicago

Every Municipal Engineer

who is at all interested in
Buying or Selling

Rails, Cars
Locomotives
Machinery, Steel Piling
Tanks, Wire Rope, etc.

should get *Bulletin 237*
70 pages — *Good Stuff*

ZELNICKER IN ST. LOUIS

WILEY BOOKS FOR HEALTH OFFICERS

The Pasteurization of Milk

From the Practical Viewpoint. A Handbook Relating to the Installation, Operation and Control of Pasteurizing Plants. Useful to Milk Dealers, Students in Dairy Schools, Public Officials Having Control of Milk Handling, and of Interest to the General Public. By Charles H. Kilbourne, late Chief of the Division of Pasteurizing Plants, New York City Department of Health.

The very complete and comprehensive title will give the reader a good idea of the scope of this book. The author's practical experience has qualified him to speak with authority on the subject.

iv + 248 pages. 4⅛ by 6. 34 figures. Cloth, $1.25 net.

The Examination of Milk for Public Health Purposes

By Joseph Race, F. I. C., City Bacteriologist and Food Examiner, Ottawa.

A practical handbok for those engaged in the chemical and bacteriological examination of milk. It will also be of material assistance to students and other who have previously assimilated the fundamentals of bacteriological technique. In the bacteriological section all methods are included that have been proved to be reliable.

vi + 224 pages. 5¼ by 8. Cloth, $1.75 net.

The Microscopy of Drinking Water

By George Chandler Whipple, Gordon McKay Profesor of Sanitary Engineering, Harvard University and the Massachusetts Institute of Technology. With a chapter on The Use of the Microsope, by John W. M. Bunker, Ph.D. Third Edition, Rewritten and Enlarged, with Colored Plates.

A guide to the water analyst and the water-works engineer. For this Third Edition the first part of the book has been rewritten, new material has been inserted in almost every chapter, and several new chapters have been added.

The plates showing the common organisms have been printed in colors, making the identification of the organisms somewhat easier.

xxi + 409 pages. 6 by 9. 73 figures and 6 plates in the text and 19 full-page plates in colors. Cloth, $4.00 net.

10 DAYS FREE EXAMINATION

John Wiley & Sons, Inc., 432 Fourth Ave., N. Y. City.

Gentlemen:—Kindly send me for 10 days free examination the following books:

.....

.....

.....

It is understood that I am to remit the price of these books, or return them, carriage charges prepaid, within 10 days after their receipt.

Name.....

Address.....

(Indicate on the line above if you are a subscriber to American City; or give the name of the engineering society of which you are a member. If you are not a member of any society, kindly give a reference or state your position.) AC 4-18

Free Examination — No Cash In Advance

You can examine these books for 10 days, without sending cash in advance. This privilege is extended to subscribers to *American City*, or to members of any National engineering society. If you are not a subscriber or a member of any society, you can supply a reference, or indicate your position.

JOHN WILEY & SONS, Inc.

432 Fourth Avenue, New York

London: CHAPMAN & HALL, Ltd.

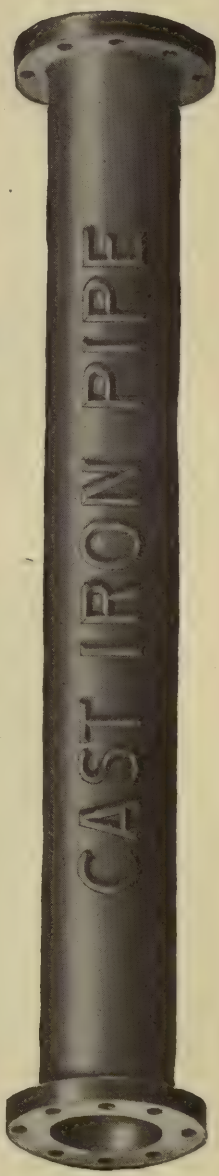
Montreal, Canada — Renouf Publishing Co.

Manila, P. I. — Philippine Education Co.

Nature and Wisdom

always say the same---

CAST IRON PIPE



Nature—because like a good mother she knows and protects her own. Witness the thin protective surface coating of rust which she bestows upon Cast Iron Pipe thus protecting it from actual deterioration.

Wisdom—because the world counts that man wise who profits by the experience of others. Witness the vast mileage of Cast Iron Pipe which serves mankind. A service measured not alone by miles but by centuries.

The Cast Iron Pipe Publicity Bureau

1 Broadway, New York

The Noiseless Typewriter

Increases productive power by giving the mind a fair chance.

Hence at a time of world crisis it is the helpful servant of those who with intense effort are bending their energy to accomplish great results.

Readers of this Magazine will be interested to learn that the Noiseless Typewriter is used exclusively in the office of the American City.

Send for literature and an impressive list of users; or better still, ask for a demonstration and test at your own office.

The Noiseless Typewriter Company

253 BROADWAY, NEW YORK

Other Offices in

CHICAGO
PHILADELPHIA
BOSTON
DETROIT
CLEVELAND
SAN FRANCISCO
LOS ANGELES
and MONTREAL

Two New Books That You Will Want On Your Desk

A NEW MUNICIPAL PROGRAM

Edited by Clinton Rogers Woodruff

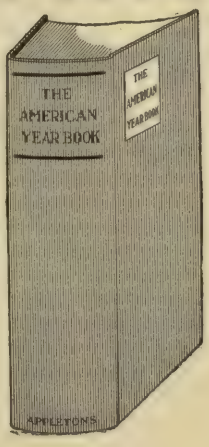
The latest thought on civic government
By the best thinkers of the day
Each chapter written by an expert

This book offers a complete and practical program of municipal reform as it has been found efficient in various cities of the United States. Each phase of city government is taken up in a separate chapter, written by a man who has devoted years to the study and investigation of his special problem. The book takes up in detail the model city charter, administrative organization, city planning, the franchise policy, etc. Among the contributors are such prominent men as Abbott Lawrence Lowell, President of Harvard University, and William Bennett Munro, Professor of Municipal Government at Harvard.

National Municipal League Series. 12mo. Cloth. $2.00 net.

THE AMERICAN YEAR BOOK

Edited by Francis G. Wickware



A complete compendium of American life for the year 1917. This volume covers every field of American activity, political, scientific, artistic and social. There are thirty-one sections, each with hundreds of articles written by a special expert. Such timely matters as war surgery, the Liberty Loan, camouflage, and the activities of the Red Cross are thoroughly dealt with. Every word of the material is authoritative. And the book is completely indexed for ready reference.

8vo. Cloth. $3.00 net.

These Are Appleton Books

The National Municipal League Series—The Best Books on Civic Government

Write for our complete list of books covering every phase of civic affairs. Each volume is the authority of its field.

35 W. 32 St. **D. APPLETON & COMPANY, PUBLISHERS,** New York

"Your City Is a Thing Alive, Throbbing With Human Energy; Growing, Changing Every Day Towards Something Different."

What will this something be? Do you want your city to realiz best possibilities?

Or is your city to be cursed by poor pavements, inadequate fire tection, impure water, traffic congestion, poor railroad facilities, unhea living conditions, lack of adequate parks and playgrounds—by any score of other physical faults that may retard a city's progress?

Is it to be a city where the doctrine of "each man for himself" holds s where the "knocker" is the most powerful factor in the community, w effective cooperation is seldom in evidence—the sort of city that young leave "because there are no opportunities"?

Do you appreciate how largely you and your neighbors can deter your city's future? THE AMERICAN CITY points the way by show you the best that is being done in other cities and towns which are ha the same problems to contend with as you yourselves.

Do you appreciate how much can be done towards improving your conditions by placing THE AMERICAN CITY in the hands of leading municipal officials, as well as the directors of your Chamber of C merce, etc.? If you will fill in and send us the blank below we shall be to send you further particulars.

THE AMERICAN CITY, Tribune Bldg., N. Y.

Please send particulars regarding club subscriptions.

Name .....

Address .....

ERE
S
OUR
OY

LEND
HIM
A
HAND

He Also Fights

Who Helps a Fighter Fight

The supremely important business of America now is to win this war. This sixteen-page pictorial message on that subject is made possible by the patriotic co-operation and support of the following firms:

American Can Co., New York
Bond Co., Harold L., Boston, Mass.
Buffalo Municipal Equipment Co., Buffalo, N. Y.
Cast Iron Pipe Publicity Bureau, New York City
Clark Co., H. W., Mattoon, Ill.
Deming Co., The, Salem, O.
Lynchburg Foundry Co., Chicago, Ill.
Minwax Co., New York
Pioneer Asphalt Co., Chicago, Ill.
Pittsburgh Filter Mfg. Co., Pittsburgh, Pa.
Pratt & Cady Co., Inc., Hartford, Conn.
Sewer Pipe Mfrs. Assn., Akron, O.
Spray Engineering Co., Boston, Mass.
U. S. Cast Iron Pipe & Foundry Co., Burlington, N. J.

The Road To Berlin
He Is Building It

YARD by yard—mile by mile—this man, and millions like him—the best of America's young hood—are building the road to Berlin—the road to VICTORY!

He gladly offers his life that America may live; that American homes may be safe forever fr terror of German arms.

Daily, hourly, he will face a thousand chances of death from the air, on the earth, and from the under the earth; from gas and mines and snipers' bullets; from bombs and shells and flying shrapn

He is going in with American pluck and American resourcefulness, but his sacrifice will be i unless you "carry on," unless you equip him to meet the Prussian on equal terms.

HE NEEDS YOUR HELP

Look Him in the Eye

and Then Buy All the Liberty Bonds You C

In co-operation with the Liberty Loan Committee this advertisement is published by

CAST IRON PIPE PUBLICITY BUREAU, New York City

If you would like reproductions of this page singly or in quantities let us know.

'he Road To France—
le Is Keeping It Open

; is fighting German submarines and German shells. *We can't win the war without him.* He faces the biting winds of the North Atlantic with a smile and a song—but 'way down in his heart is the .edge that he is facing the biggest job that has ever fallen to the American Navy. . . . An ever .sing army of American soldiers in France is doing its part in a way to win the admiration of the .

Jew troops must back them up. A ceaseless supply of food, guns, shells, airplanes and tanks must ıt to their support.

'he victory of our arms—the very existence of our armies—depends upon safe transport through ıfested with submaıines.

'he American sailor will do his part—if we will lend him a hand. He needs money—lots of it—ıps and shells to keep open the road to France. We will not fail him.

The American Sailor Is Doing His Part—
ET US DO OURS! BUY LIBERTY BONDS!

In co-operation with the Liberty Loan Committee this advertisement is published by

CAST IRON PIPE PUBLICITY BUREAU, New York City

If you would like reproductions of this page singly or in quantities let us know.

Worth Fighting For?

SHALL this little boy grow up in the sort of American home we know, healthy and happy? Shall he have the advantage of living and learning in a free land, under free institutions? Shall such children develop into Liberty-loving citizens that a free America may be proud of?

For over two hundred years Americans ha fought valiantly, and died gallantly, to w for themselves and hand down to their posteri the blessings of liberty, justice, self-gover ment and equal opportunity. This precio heritage, bought at so great a price, is n threatened.

The question which today confronts America as a nation, and you as an individual is whether or not a free America is worth fighting for

Are American children in this and all future generations to receive unimpaired the legacy of freedom of which we are now the custodians, or shall their country be turned over bodily to the brutal, rapacious, power-mad ener which has forced us into this war?

This question cannot be answered by wo of mouth, but by deeds alone.

Let your answer be your investment in

Liberty Bonds!

In co-operation with the Liberty Loan Committee this advertisement is published by

LYNCHBURG FOUNDRY CO. - - Chicago, Ill.

If you would like reproductions of this page singly or in quantiities let us know.

WOULD YOU FIGHT for Your Own CHILDREN?

You have heard of the hardships and atrocities which have been visited upon helpless little children in Belgium and other countries where the German army has gained a footing.

Would you like your children to be starved, beaten or even mutilated, as has happened in many cases to innocent little noncombatants at the hands of German soldiers? Just imagine how you would feel if a band of Huns were entering *your* home.

We cannot all be on the firing line, but we can all back the government financially in its fight for liberty and decency. We cannot all go "Over the Top" but we can all

BUY LIBERTY BONDS

In co-operation with the Liberty Loan Committee this advertisement is published by

PIONEER ASPHALT CO., Chicago, Ill.

If you would like reproductions of this page singly or in quantities let us know.

To Save the Lives of Our Brothers and Sons

Invest in U. S.

Liberty Bonds

THE STATUE OF LIBERTY IS A WELCOME SIGHT TO OUR NAVY BOYS

Let's send word to our men in the navy as they guard the ocean paths to France, that we are with them—that we believe in them—trust them—love them—and will back them up to the limit. Let's make sure that they smile more broadly than ever when they hear about the Third Liberty Loan—let's send them a wireless that we've come through with every dollar we could rake together to arm, clothe and feed them as they fight their way to victory!

In co-operation with the Liberty Loan Committee this advertisement is published by

H.W. CLARK CO.

Mattoon, Ill.

If you would like reproductions of this page singly or in quantities let us know.

What Will Protect YOU *If These* Are Defeated?

Our army and navy are the protectors and the only protectors of *your* home—*your* family—*your* income—*your* property.

What will become of you and yours if these protectors are weakened and rendered insufficient to their task?

They will not be defeated by the enemy.

The only way they can be defeated or weakened is through *your* failure to support them with ships, food, weapons, ammunitions, clothing and supplies.

Your life, your business, the future of your family, may depend upon how much real effort and *sacrifice* you make to invest in

Liberty Bonds

In utilizing this advertisement to talk Liberty Bonds rather than our own business, we do so in the firm belief that there will be little of either pleasure or profit in our business or any American business unless Liberty wins this war.

HAROLD L. BOND Co Boston, Mass.

If you would like reproductions of this page singly or in quantities let us know.

L.V. REAVIS

How Much of Your Pay Do You Th
You Can Keep if Germany Wins This W

If, to help America win this war, you buy

Liberty Bond

to the very limit of your ability you are not m
helping America. You are not merely making a
investment. You are not merely helping to
peace nearer. You are doing all these things, a
addition you
buying the best
tection for your
individual pros
ity—yes, the
real protection
can buy.

Universal Support of the Government is loyalty and patriotism and besides—
if Uncle Sam is not victorious in this war there will be mighty little profit n
business for U. S.—Autocracy is a close collector.

PITTSBURGH FILTER MFG. Co Pittsburgh, Pa.

If you would like reproductions of this page singly or in quantities let us know.

The THIRD LINE of DEFENSE
Get into it and Dig

LIBERTY LOAN

In this line every true American can and will help to win the war. Invest in

Liberty Bonds

BUFFALO MUNICIPAL EQUIPMENT Co
Buffalo, N.Y.

If you would like reproductions of this page singly or in quantities let us know.

how little would the sacrifice be compared to theirs.

We are not asked to give. We are asked only to *lend*. To lend at good interest secured by the best collateral on earth

U. S. Liberty Bonds

In co-operation with the Liberty Loan Committee this advertisement is published by

AMERICAN CAN CO. New York City

If you would like reproductions of this page singly or in quantities let us know.

ill You Invest our Money With ncle Sam Now?

r Let Germany ake It Away rom You Later?

Be practical. Look squarely at the facts. We will either invest our money with Uncle Sam now, at good interest rates, to help him win this war, or we will give it up later to pay Germany's war cost—and as much more as Germany chooses to collect. **Invest in**

Liberty Bonds

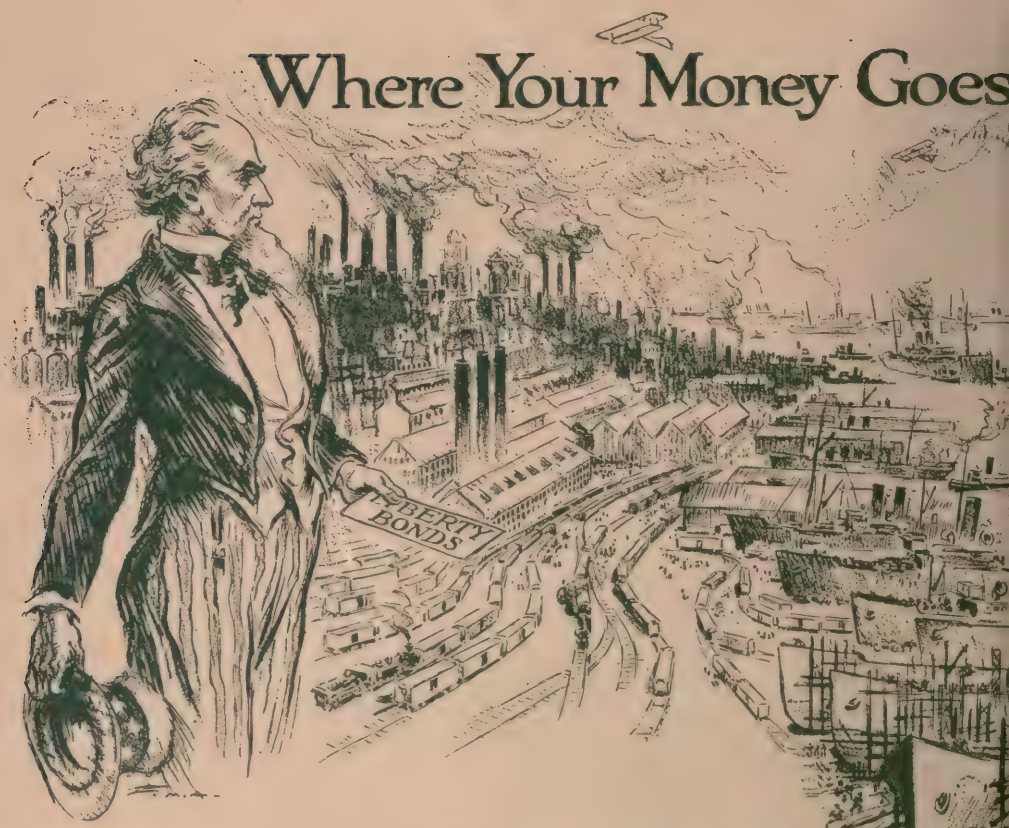
Today

In co-operation with the Liberty Loan Committee this advertisement is published by

The MINWAX Co INC New York City

If you would like reproductions of this page singly or in quantities let us know.

Where Your Money Goes



WE are now building more naval and merchant ships than we have constructed in the last generation.

We are building a vast fleet of airplanes, and enormous supplies of artillery, motor trucks, machine guns, rifles and ammunition. We are feeding, clothing and training an army of a million men, and preparing for a million more. We have loaned billions of dollars to our allies to be spent in the United States.

From the shipyards of the Pacific to those of the Atlantic; on our farms and in our mines, mills and factories in every state in the Union; back of the firing lines in France, where men are training, camps are being erected and railroads built, billions upon billions are being expended for labor, for transportation, for materials and supplies of every description.

The mind can hardly conceive the sums of money required for our war preparations. Yet these expenditures are absolutely essential. We must win the war quickly if possible; we must carry it on for years if necessary. We must do the job with American thoroughness, let the cost be what it may.

Remember, whe invest in your Li Bonds, that th immediate, urg imperative nee every dollar yo possibly spare.

In co-operation with the Liberty Loan Committee this advertisement is published by

SPRAY ENGINEERING Co Boston, Mass.

If you would like reproductions of this page singly or in quantities let us know.

Put your money in this bank

It's the safest in the world. It pays you good interest. And your deposits in it help to insure a priceless heritage of freedom and peace for your children and your childrens' children.

To the limit of your resources

Invest in the Third U. S.

Liberty Loan

In co-operation with the Liberty Loan Committee this advertisement is published by

THE DEMING Co. Salem, O.

If you would like reproductions of this page singly or in quantities let us know.

COLUMBIA'S BANK OF LIBERTY

YOU are asked to save every cent not needed for your reasonable support and physical well being—this is thrift

Bonds Are Not A Burden But A Blessing

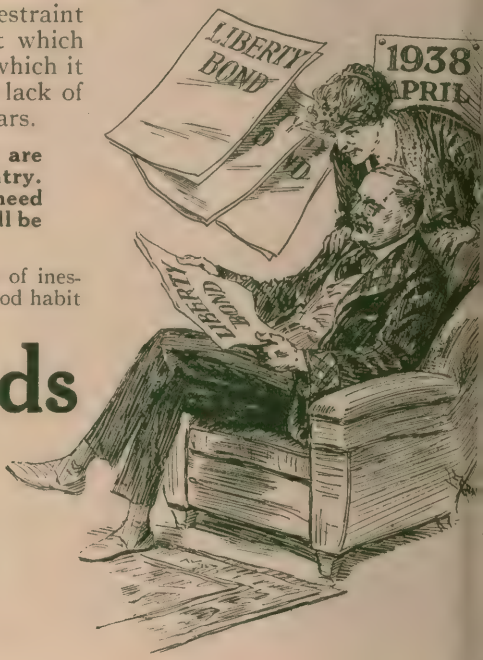
THRIFT requires the exercise of restraint and self-denial—qualities without which you cannot achieve the success in life which it is your ambition to achieve, and for the lack of which you are likely to suffer in later years.

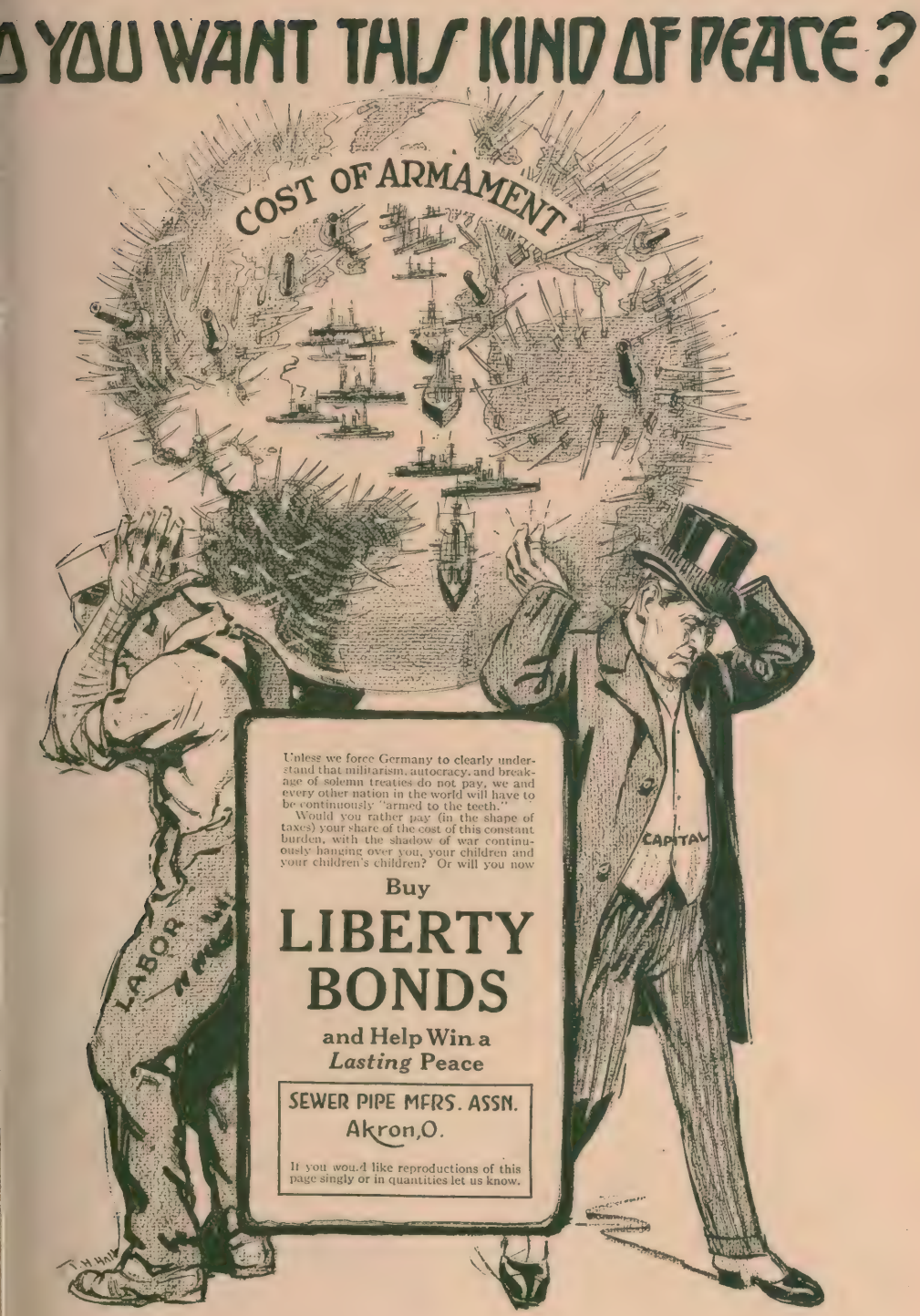
The money you acquire by thrift you are asked to loan—not give—to your country. It will come back to you when you may need it far more than you do now, and you will be paid interest for its use.

This war is a frightful thing, but it may prove of inestimable benefit to you, if it teaches you the good habit of thrift. Start the habit by investing in

Liberty Bonds

U.S. CAST IRON PIPE & FOUNDRY Co
Burlington, N.J.




DO YOU WANT THIS KIND OF PEACE?
COST OF ARMAMENT
LABOR
CAPITAL
Unless we force Germany to clearly understand that militarism, autocracy, and breakage of solemn treaties do not pay, we and every other nation in the world will have to be continuously "armed to the teeth."
Would you rather pay (in the shape of taxes) your share of the cost of this constant burden, with the shadow of war continuously hanging over you, your children and your children's children? Or will you now
Buy
LIBERTY BONDS
and Help Win a Lasting Peace
SEWER PIPE MFRS. ASSN.
Akron, O.
If you would like reproductions of this page singly or in quantities let us know.

VICTORY

We are going to

Win This War

The victory, like everything worth while in life, will require sacrifice, self denial, ungrudging effort.

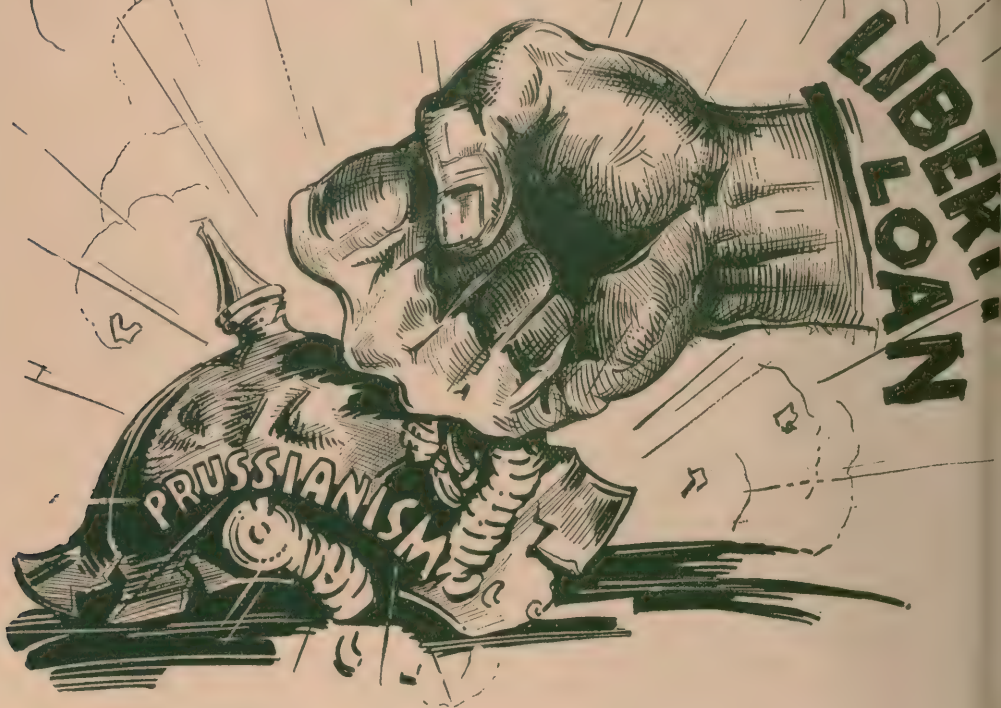
In defense of Liberty, Justice and Civilization, we must use every weapon at our command. And not the least of these is money. Never in the history of the world has there been a truer cause. Invest in

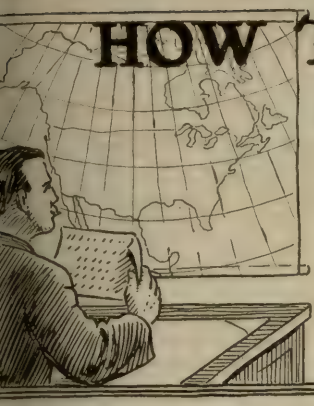
Liberty Bonds

In co-operation with the Liberty Loan Committee this advertisement is published by

PRATT & CADY Co. INC. Hartford, Conn.

If you would like reproductions of this page singly or in quantities let us know.





HOW THEY DO IT IN OTHER PLACES

Valuable Illustrated Material, Statistics, Etc., Regarding Methods, Materials and Appliances for Public Improvement Work, Sent Free of Charge

Manufacturers, engineers and others doing business with municipalities are invited to submit catalogs or circulars suitable for mention in these columns. THE AMERICAN CITY *should always be mentioned when writing for this material. Officials who check over these items each month and write for such printed matter as interests them will find this a convenient way of keeping their information files up to date.*

nomical City Purchases.

'he Searchlight Department of the *Engineering Iews-Record,* Tenth Avenue and Thirty-sixth Street, New York, has some interesting printed iatter for free distribution to city officials about o make purchases, let contracts or issue bonds for iunicipal improvement work. If you would like o know how other cities are saved considerable ums of money in placing contracts for sewer ystems, water supply, paving, road building, etc., end your address to the *News-Record* and it will iail you some valuable material.

lebaker Hand Carts and Dump Carts.

Two folders, serial Nos. 1213 and 1215, respectively, have been issued by the Studebaker Corporation, South Bend, Ind. The first of these lescribes dump carts for use by contractors, and n farms. The second presents hand carts useul for parks, street departments, etc. Both foldrs give detailed specifications and prices.

Inexhaustible Sanitary Drinking Cup.

.ike the widow's cruse of oil which never ran iry, "Puro," a sanitary bubbling drink fountain nanufactured by the Puro Sanitary Drinking Fountain Company, Haydenville, Mass., is a cup hat needs no replenishing. A pamphlet (Catalog A) issued by the company demonstrates that this ountain is adaptable not only to public parks and laygrounds, but to schools and other public buildngs, and to factories whose executives are inerested in the welfare and health of their emloyes. Another circular issued by this company lescribes a sanitary cooler to be used with the ountain.

ch Way Would You Lean?

A folder under this title discusses the advantages laimed for the leaning wheel grader manufacured by J. D. Adams & Company, Indianapolis, nd. An analogy is drawn between this road nachine and a man pushing a wheelbarrow against grade. Investigation is invited. Ask for Catalog C.

Efficient Fire-Fighting Chemical.

"Firefoam" they call it. It is a product of the Erwin Manufacturing Company, Milwaukee, Wis. A graphic folder issued by the company illustrates ow this chemical does its work. Briefly, it exinguishes the flames "by covering them with a mothering blanket of carbonic acid gas foam." 'he entire bulk of this gas, it is claimed, reaches he fire, as it cannot be blown away or dissipated. 'he equipment should prove of universal interest s a dependable defense in time of emergency.

Trouble Finder for Electric Supply Systems.

'o those who are struggling with the problem of uickly and accurately locating troubles of one ort or another in electrical supply systems, whether overhead or underground, the Lundin ault locater, made by the Lundin Electric & Machine Company, 10 Thacher Street, Boston, Mass., offers an efficient and effective solution of ifficulties of this nature. A pamphlet issued by he company describes the Lundin Fault Interupter and the Lundin Fault Analyzer, and tells in etail how these instruments do their work.

Unit Costs, Cleveland Electric Light Service.

A folder with this title has been prepared for distribution by F. W. Ballard & Co., Swetland Building, Cleveland, Ohio. It contains a graphic chart and table of unit costs for the electric light service in Cleveland for the years 1913-1916, inclusive. This folder should be of unusual value to engineers and city officials interested in lighting service. Special attention is called to the fact that the unit costs for practically every classification of expense have decreased during the four-year period, in spite of the fact that the cost of labor and material has increased under war conditions.

Concrete Mixers—Past and Present.

The history of Jaeger mixers is entertainingly presented in picture form in a folder issued by the Jaeger Machine Company, 215 West Rich Street, Columbus, Ohio. The earliest model shown is that made in 1911, and from the simple mechanism that then served the purposes of a concrete mixer the progress and evolution of this product is clearly traced thru the intermediate models to the latest combination outfits for grouting, spouting and paving work.

Hitch a Trailer to Your Car.

An unusually forceful argument for trailers for public service is presented in a pamphlet entitled "The Trailer and Public Service," issued by the King Trailer Company, Ann Arbor, Mich. The King pole trailers described can be hitched to any car, commercial or pleasure, it is claimed, and are of great value in emergencies where hauling of bulky material is necessary and where a horse is too slow to be practicable. Attention is called to the great economy of these trailers, as well as to their all-round efficiency.

Premolded Expansion Joints for Pavements.

A catalog describing "Pioneer" expansion joints and their installation has been issued by The Pioneer Asphalt Company, 7325 Woodlawn Avenue, Chicago, Ill. Specifications are included for its use in concrete and in brick pavements. A number of clear, full-page illustrations show the method of placing these joints, and bear witness to the lasting service they render.

Liquid Chlorine.

Water-works officials are finding Eagle-Thistle brand liquid chlorine a reliable product, and information in regard to prices, etc., may be secured from Arnold, Hoffman & Co., Inc., 61 Broadway, New York. This company also manufactures chloride and hypochlorite lime.

Trench Pumps.

Public officials and engineers having to do with trench excavation work will be interested in the catalog of the Harold L. Bond Company, 383 W. Atlantic Avenue, Boston, Mass., relative to their machinery for pumping water out of trenches.

Ornamental and Sanitary Metal Products.

A three-page folder issued by the Cyclone Fence Company, Department 107, Waukegan, Ill., presents in an attractive manner ornamental wire fencing adaptable to either public or private property. Attention is also called to their wire flower-bed borders and trellises, and a safety waste paper consumer and receptacle is described.

Continued on page 52

Valuable illustrated material, catalogs, statistics, etc., as mentioned below, relative to methods, materials and appliances for public improvement work, will be sent free of charge if you mention THE AMERICAN CITY. See page 51.

Sewer Cleaning Machinery.

The clogging of sewers is a source of much trouble to many municipalities. The catalog of the Champion Potato Machinery Company, 338 Sheffield Ave., Hammond, Ind., manufacturers of sewer-cleaning machinery, will appeal to municipalities whose sewers have not been recently cleaned.

Hydrants and Valves for Water Supply.

Catalog on this subject can be secured from the Columbian Iron Works Company, Chattanooga, Tenn.

Why Dayton Airless Tires Are Growing in Popularity.

The testimony of fire chiefs and other municipal officials on this subject is contained in a catalog distributed by the Dayton Rubber Manufacturing Company, Dayton, Ohio. Any owner or user of motor trucks will find this catalog of value.

Manhole, Catch Basins and Sewerage Castings.

Price list and descriptive matter along these lines may be secured from the Wm. E. Dee Company, 30 N. La Salle Street, Chicago, Ill.

An Efficient Dust Laying Compound.

for use in city streets and country highways is described in the printed matter of the Dustoline For Roads Company, Summit, N. J.

Why Meter Boxes?

Have you investigated the advantage of installing meters outside the house rather than in the cellar? The use of meter boxes in this connection is described in the catalog of the Ford Meter Box Company, Wabash, Ind.

Cyclopedia of Civil Engineering.

The American Technical Society, Department C—7751, Chicago, Ill., is offering at an attractive price a valuable nine-volume cyclopedia of civil engineering which is eminently adapted to home study and reference work, and should prove of great help to those who desire to improve their knowledge of highway construction, bridge engineering, water supply, sewers and drains, harbor improvement, irrigation engineering and kindred subjects. The Society will be glad to furnish descriptive literature and detailed information to anyone interested.

Power Lawn Mowers.

A catalog entitled "The 1918 Milbradt Power Lawn Mower," describes a thoroly modern and efficient lawn mower which the Milbradt Manufacturing Company, St. Louis, Mo., is putting on the market this year.

Special attention is called to the features which make this machine particularly desirable for the upkeep of lawns and terraces on private estates and in public parks where trees and shrubs make horse-drawn mowers impracticable.

Important Books on Municipal Subjects.

Among recent books embodying the latest practice and developments in the varied phases of municipal engineering and administration are the following, published by John Wiley & Son, Inc., 432 Fourth Avenue, New York City: Water Supply Engineering, by A. Prescott Folwell; Meter Rates for Water Works, by Allen Hazen, S. D.; Water Purification Plants and Their Operation, by Milton F. Stein, B. S., C. E.; The Planning of the Modern City, by Nelson P. Lewis; Parks and Park Engineering, by William Lyle; Elements of Highway Engineering, by Arthur H. Blanchard, C. E., A. M.; Sewerage, by A. Prescott Folwell; and Municipal Engineering Practice, also by Mr. Folwell. These books are careful treatises of the subjects indicated by their titles, and wide-awake officials who are seeking to increase the efficiency of the departments under their supervision will find it well worth their while to send to John Wiley & Sons for their complete catalog of books on municipal and engineering subjects.

Calculating Machines Save Public Mon

Bookkeeping and financial operations of n palities and counties are simplified to a rema degree by the use of the calculators ma Marchant Calculating Machine Company, De Emeryville, Oakland, Cal., who will send a c on receipt of your request.

Trash Cans for City Streets.

A circular on this subject can be secured the Butler Manufacturing Company, St. A Falls Sta., Minneapolis, Minn.

Cast Iron Pipe and Its Advantages.

Officials interested in comparing the relative of cast iron pipe and pipe of other constr will find of great value the booklet issued C. McWane, Secretary, Cast Iron Pipe Pu Bureau, Broadway, New York City.

Second-Hand Pumps, Tanks and C Equipment.

Anyone interested in second hand equipme public works should write to Zelnicker, St. Mo., for their bulletin No. 230, which co offerings in pumps, tanks, and other equipm a similar nature.

Tar and Asphalt Heaters for Road Roofing Work.

Non-leakable welded heaters especially const for road, street and municipal contractors a scribed in the catalog issued by Connery & Inc., 2nd and Luzerne Sts., Philadelphia, Pa cifications are given for tar and asphalt h gravel dryers, fire wagons, combination drye heaters with patent features, portable heate patrol and other purposes, patch heaters—in equipment for every roofing or asphaltin large or small.

Equipment for Armored Concrete P ments.

The functions of the products of the R. D. Company, Detroit, Mich., in concrete paving from the laying of the side forms to the fin of the surface, are ably set forth in a pa issued by the company under the title, "T Equipment for the Baker Armored Concrete ment." Illustrations show the installatio Baker side forms and curb forms, as well armor plates and expansion joints. Vie finished stretches of road after years of s show the practical value of these pro Striking photographic contrasts present a answerable argument for the finishing mach against the old method of hand finishing.

Keeping the Kiddies at Play.

Everyone interested in playgrounds and recr work will find it worth while to send for the log of playground apparatus supplied free of by The American Playground Device Co W. 25th Street, Anderson, Ind.

Fire Department Apparatus and Suppli

Motor fire apparatus and equipment for all s fire department work is described in the c of the Anderson Coupling & Fire Supply Co Kansas City, Kansas.

Municipal Economy Thru Water Mete

Do you appreciate the tremendous saving would result from the installation of water on every water service in your city? If inte in water meters you will find it worth wl send for the catalog of the Badger Meter Mf Milwaukee, Wis.

Prisons and Jails.

E. T. Barnum Iron Works of Detroit, Mi have an illustrated catalog for free distri describing prisons which they construct for ipalities and counties.

Fire Hose Which Does Not Leak.

The reasons why Bi-Lateral Hose gives bett longer service on account of its special f construction are described in the booklet whi be secured on application to The Bi-Latera Hose Company, 326 West Madison Street cago, Ill.

SIGNS

kinds of durable and ornamental
ns.

Street Names, *Catalog B*
Road Direction
Park } *Catalog C*
Warning
Traffic, *Catalog D*

alogs illustrated in colors, send for any one or all of them.

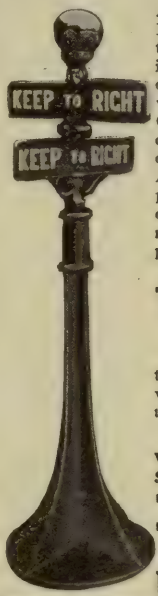
OSEPH N. EARLY
Est. 1861
Patentee and Manufacturer
) Broadway :: New York

King Poles and G. E. tops make the best lighted streets

Send for our beautifully illustrated booklet—free.
Send name and address today.

KING FOUNDRY CO.
55 W. Jackson Blvd.
Chicago, Ill.

The Leb-Iron Traffic Sign



Wt. of Base, 150 lbs.
Total Wt., 225 lbs.

A Substantial, Efficient, Silent Policeman. The words "Keep-to-the-Right" are in 2½ and 1½ inch letters, rounded and stand out a half-inch from the boards, which are covered with Red or Green smalts as desired. The covering is carefully baked in electric ovens, insuring long life. A 7-inch Red or Green Globe is placed on the top, which is about on the level with the chauffeur's range of vision. It cannot be passed unnoticed.

The Base Weighs 150 Pounds

the complete sign, 225 lbs. Provision is made for wiring from underneath or overhead.

Price complete, including Wiring Lamps and Fixtures, $20; plain, with provision for attaching Lantern, $16.

The Lebanon Machine Co.
Lebanon, N. H.

ITY OFFICIALS

us have your inquiries on

Sewer Cleaners
Traps
Storm Water Inlets
Sewer Cleaning by contract
Traffic, Warning, Street Name Signs
General Equipment.

'falo Municipal Equipment Co.
tual Life Bldg. Buffalo, N. Y

Street Signs Road Guide Posts Traffic Signs

The Kind That Last

Made of Heavy Galvanized Iron with letters sunken into plate.

If you are looking for *permanent* signs instead of the short lived ordinary variety write to us for prices, illustrations and further particulars.

Union Iron Products Co.
Drawer H-2 E. CHICAGO, IND.

BEST PAVING BRICK MADE

THE METROPOLITAN PAVING BRICK COMPANY
"THE WORLD'S LARGEST"
CANTON, OHIO

Proposal and For Sale Notice, Help Wanted and Situation Wanted Advertisments, Etc.

STREET PAVING

GENEVA, N. Y.

Sealed proposals will be received by the Board of Public Works of the City of Geneva, N. Y., until 2:30 P. M., Tuesday, April 16, 1918, for the resurfacing with asphaltic concrete, sheet asphalt or bitulithic; South Main, Seneca, Linden, South Exchange, Sherrill and East Castle Streets, according to plans and specifications on file in the office of the Board. All proposals must be on forms furnished by the Board of Public Works and accompanied by a certified check drawn on some national or state bank and made payable to the city of Geneva for 5 per cent of the amount of the proposal.

Approximate yardage, 30,000 square yards.

Monthly payments for the work satisfactorily performed will be made to the amount of 75 per cent of the work done. The right is reserved to reject any or all proposals. H. K. SEYBOLT,
Superintendent.

MOTOR FIRE APPARATUS

HOPEWELL, VA.

Sealed proposals addressed to the undersigned and plainly marked "Bid on Fire Apparatus" will be received until noon of April 22, 1918, on furnishing to the City of Hopewell, Virginia, one (1) motor-driven chemical, ladder and hose combination, complete, with 40-gallon chemical tank, 200 feet chemical hose and hose body to accommodate 800 feet 2½-inch fire hose, full complement of hose and ladder from 8 to 50 feet, with such other tools and accessories as are usually carried with such equipment. The city reserves the right to reject any or all bids.

(Signed) P. G. BUNTING,
Chairman Fire Committee,
Box 62, Hopewell, Va.

NOTICE TO CONTRACTORS

TWIN FALLS, IDAHO.

Sealed proposals will be received at the office of the City Clerk, Twin Falls, Idaho, up to three (3) o'clock P. M. of Thursday, the eighteenth (18th) day of April, 1918, for furnishing material and labor and constructing improvements to the water-works system in and for said city. Separate bids will be entertained as follows:

Contract No. 1—General Construction Contract—For furnishing labor, equipment and material for the construction of concrete settling basins, filter basins, clear water reservoir and brick filter house for a six-million (6,000,000) gallon per day mechanical water filtration plant.

Contract No. 2—Pipe Laying and Trenching Contract—For trenching and hauling and laying cast iron and wood pipe mains for supply line and distribution system.

Contract No. 3—Filter Equipment Contract—For furnishing, erecting and installing the equipment for four (4) one-million (1,000,000) gallon mechanical filter units with alternate bids on equipment of two (2) additional units.

Contract No. 4.—Cast Iron Pipe Contract—For furnishing cast iron pipe and special castings F. O. B. cars, Twin Falls, Idaho.

Contract No. 5—Steel Pipe Contract—For furnishing steel pipe and special fittings, F. O. B. cars, Twin Falls, Idaho.

Contract No. 6—Wood Pipe Contract—For furnishing machine-banded wood pipe and special cast iron fittings, F. O. B. cars, Twin Falls, Idaho, and continuous stave wood pipe erected in trench, Twin Falls, Idaho.

Contract No. 7—Hydrant and Valve Contract—For furnishing hydrants and valves F. O. B. cars, Twin Falls, Idaho.

Each and every bid must be accompanied by a certified check payable to the City Treasurer and certified to by a responsible bank for an amount of ten per cent (10%) of the sum of the bid.

All of the above material and work to be furnished and done in accordance with the plans and specifications on file at the office of the City Clerk, Twin Falls, Idaho, and at the office of Burns & McDonnell, Engineers, Kansas City, Mo. Anyone desiring further information relative to the work, or extra copies of the plans for personal use, may obtain the same from the engineers by making the following deposits for the plans covering various sections of the work:

Complete set covering all contracts	$15.00
Contract No. 1	10.00
Contract No. 2	5.00
Contract No. 3	10.00
Contract No. 6	5.00

Refunds will be made upon the return of the plans to the engineers on or before April 25, 1918.

The city reserves the right to reject any and all bids.

F. F. BRACKEN, Mayor.
W. A. MINNICK, City Clerk.
BURNS & McDONNELL,
Engineers, 402 Interstate Building,
Kansas City, Missouri.

THE STATE OF DELAWARE
STATE HIGHWAY DEPARTMENT
ADVERTISEMENT FOR BIDS

Sealed proposals will be received by the State Highway Department, at its offices in Dover, Delaware, until two (2) o'clock P. M., April 15th, 1918, and at that place and time publicly opened and tabulated, for the construction of the State Highways in the State of Delaware, involving the following contracts:

CONTRACT No. 1: Kent County
4.05 miles cement concrete roadway.
CONTRACT No. 2: Kent County
4.90 miles cement concrete roadway.
CONTRACT No. 3: New Castle County
2.46 miles vitrified brick roadway with concrete foundation.
CONTRACT No. 4: New Castle County
3.75 miles vitrified brick roadway with concrete foundation.
CONTRACT No. 5: Sussex County
6.06 miles cement concrete roadway.
CONTRACT No. 6: Sussex County
4.90 miles cement concrete roadway.
CONTRACT No. 7: Sussex County
6.61 miles cement concrete roadway.
CONTRACT No. 8: Sussex County
6.36 miles cement concrete roadway.

Performance of contract shall commence within ten (10) days after execution of the contract and be completed on or before December 31, 1918.

Monthly payments will be made for ninety (90) per cent of the work completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by a surety bond, certifie money to the amount of t centum of the amount of th

The envelope of the prop marked:

"Proposal for the Constr State Highway under Contr

The contract will be aw jected within twenty (20) the date of opening proposa

The right is reserved to r all bids.

Plans and specifications tained from the Departmer Delaware, by depositing te lars, which will be refund plans and specifications a in good condition.

Plans may be seen and and detailed information ob

CHAS. M. UPHAM, Chie
State Highway
at Dover,

Experienced
& Cemetery
Desires Cha

Advertiser desires po
Park or Cemetery Superi
or manager of a privat
Life experience in all branc
ticulture, forestry and lands
Has held position of Park
tendent in a Canadian ci
past 6 years, having full m
of its Parks, Boulevards, Pl
Golf Course and Cemet
highly recommended.

Apply W. R., care of Ameri

Chambers of Co

desiring the services
cient and well-train
retaries are invited to
Box, 201, American

Secretary De
Change

City over 25,000, sa
start $3,000 and tra
tion. Have recently
a Chamber of Comm
of almost hopeless d
made it a live organ
Correspondence invit
dress, Box 200, A
City.

OZONE

The Most Powerful Germicide and Oxidizing Agent Known to Science

PURIFIES WATER

by destroying

ODORS, TASTES and BACTERIA

Harmless, Inexpensive, Effective

Mr. Geo. A. Soper in Engineering News, Vol. 42, age 250, says, "The claims made for the ozone reatment of water are as distinct and its functions s clearly defined as are those of filtration and sedi-ıentation. Ozonation aims to eliminate bacteria rom water and to destroy unpleasant colors and dors of vegetable origin. It is especially valuable ı removing unpleasant odors."

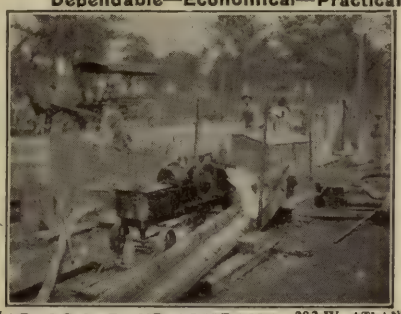
We furnish ozone systems for cities, institu-ions, etc.

Electric Ozone Sterilizer Co.

53 W. Jackson Blvd., Chicago, Illinois

ATLANTIC PUMPING ENGINES

Dependable—Economical—Practical



Send for 1918 Catalog

HAROLD L. BOND COMPANY, 383 W. ATLANTIC AVE. BOSTON, MASS.

Silica-Graphite is Nature's own paint pigment, and as mixed with pure boiled linseed oil in

DIXON'S SILICA GRAPHITE PAINT

forms the best protection against the most powerful agents, corrosion and decay. Write for Booklet No. 107-B.

Made in JERSEY CITY, N. J., by the

JOSEPH DIXON CRUCIBLE CO.

Established 1827

GRAVITY **FILTERS** PRESSURE

WATER SOFTENING PLANTS AND HYPOCHLORITE APPARATUS

ALL VARIETIES OF CHEMICAL FEEDING DEVICES

Write for Bulletin 17-3

THE NEW YORK CONTINENTAL JEWELL FILTRATION CO.

NUTLEY, N. J.

FOOS ENGINES

Producer and Natural Gas, Kerosene and Distillate

6 to 325 Horse Power

For electric light and water works. Engineering data furnished for municipal projects

THE FOOS GAS ENGINE CO. - - Springfield, Ohio

S A LIFE WORTH $39.70 IN YOUR TOWN?

Every city but one in Iowa over 5,000 population has ıngmotor protection—for protection in cases of

Gas Asphyxiation,
Drowning,
Electric Shock,
Asphyxia at Birth,
Etc.

Total cost of Lungmotors $3,375—lives saved to dat —cost each life saved $39.70.

Remember every additional life saved, this cost is reduced.

What is it worth to save lives in your town?

Send for full information

IFE SAVING DEVICES CO., 564 1-2 W. Monroe St., CHICAGO, ILLINOIS

Cities and Towns Counties and States

in every part of the country are saving thousands of dollars for tax payers by means of little ads in the

Proposal Advertising Columns

of the

ENGINEERING NEWS-RECORD

This paper, with its circulation of 35,500 copies weekly, is read by practically all the important contractors and manufacturers who want contracts and know how to figure close in order to land them.

Get their prices on YOUR Contracts

It means a big saving, reliable work and the best evidence that you believe in business methods in municipal government.

To see how other towns save money

write for a recent copy of the Engineering News-Record (free) and look through the Proposal pages of this

One Nationally Recognized Medium for Proposal Advertising

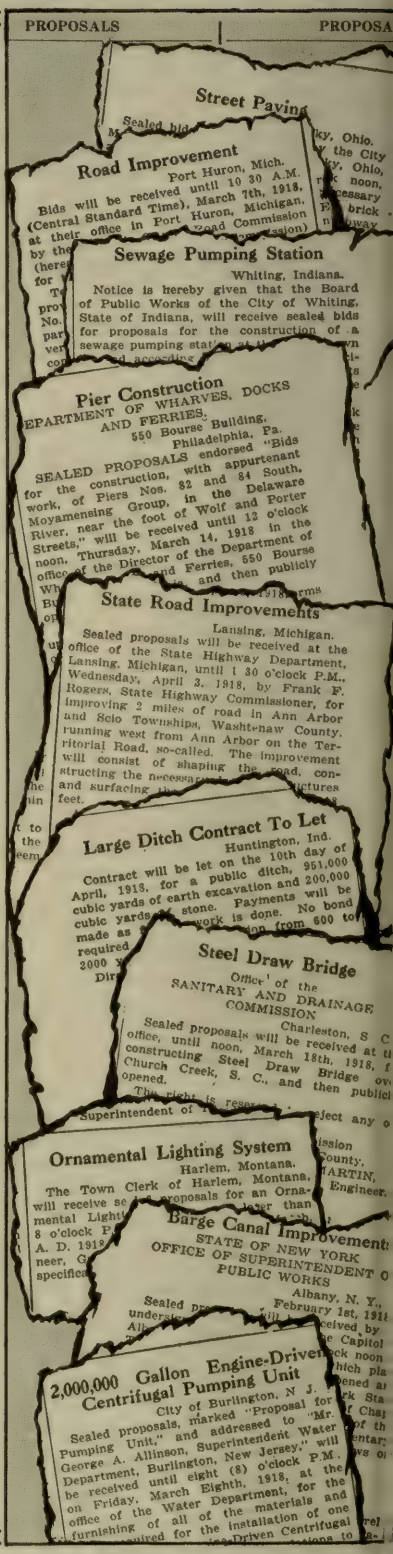
ADDRESS THE SEARCHLIGHT DEPARTMENT

ENGINEERING NEWS-RECORD

10th Ave. at 36th St., New York

PHILADELPHIA
CHICAGO

CLEVELAND
SAN FRANCISCO



HAROLD S. BUTTENHEIM, Editor THEODORE R. KENDALL, Engineering Editor M. V. FULLER, Associate Editor

THE AMERICAN CITY

Published Monthly by The Civic Press, Tribune Building, New York—EDGAR J. BUTTENHEIM, President
HERBERT K. SAXE, Secretary-Treasurer—JAMES H. VAN BUREN, Advertising Manager
Branch Offices: Chicago, 327 South LaSalle St.—J. T. Dix, Western Representative
San Francisco, 320 Market St.—W. A. Douglass, Pacific Coast Representative
Entered at the Post Office at New York, N. Y., as second-class matter

Vol. XVIII CONTENTS FOR APRIL, 1918 No. 4

ARTICLES APPEARING IN THE CITY EDITION ONLY

Conserving Capital for War Uses 289
Santiago: The Heart of Chile 291
Municipal Finance—Its Relation to Pavement Construction and Renewals 297
The Importance of Inspection of Paving Materials 298
Long Radius Curbs for Greater Safety 300
The Lighting of New York City's New $3,000,000 Garbage Disposal Plant 301
The Swimming Pool and Its Operation ... 305
Municipal War Service Resolutions 311

ARTICLES APPEARING IN THE TOWN AND COUNTY EDITION ONLY

New York State's Experience with Various Types of Road Construction under Various Traffic Conditions 289
Bituminous Surface Treatments for Gravel and Broken Stone Roads 295
McAdoo, Baker and Hoover Comment upon Road Building as a War Necessity 300
Some of the Phenomena of Road Drainage 301
The Maintenance of Bridges 305
Roadside Planting 310

ARTICLES APPEARING IN BOTH EDITIONS

Will Your City Exceed Its Quota in the New Liberty Loan? 313
Items of Municipal Law 314
Forward Steps Reported by Municipal Officials and Heads of Departments 315
- Food Direct from Producer to Consumer
- A Combination Sand Truck and Street Sprinkler
- City Departments Get Acquainted
- Methods of Curing Concrete Pavements
- Efficiency of Department Workers Rewarded
- Making Street Intersections Safe at Night
- Contracts for Vacant Lot Gardening
- Community Gymnasium Work for All Ages
- Suction Sweeping for City Streets

Prepare Fuel for Next Winter 326
The Civic Work of Educational Institutions 327
- Individual Instruction vs. The Lockstep System
- Lending Good Pictures to the Public Schools

Planning the Cantonments 331
A War Garden for Every Home 337
Graphic Exhibits on Food Conservation .. 338
"The Great American Bonfire"—Who Is Responsible for It? 339
On the Calendar of Conventions 341
Motor Apparatus in Many Kinds of Service 342
Ornamental Concrete Shells for Steel Water Tanks 344
"Thrift" in Water-Works Installations.... 345
The Rotary Ballot in Calgary 347
News and Ideas for Commercial and Civic Organizations 349
- Ten Thousand War Gardens This Year
- Corn-Growing and Pig-Raising Clubs
- Census of County Agricultural Resources
- Farmers and Business Men Discuss Food Problems Constructively
- Charlotte's War-Savings Stamp Campaign
- Block-by-Block Plan of Canvassing
- Americanization Work in Manistee
- Down with the Billboards!
- Professional vs. Amateur Baseball
- A Full-Time Health Officer for Poughkeepsie
- Collecting Membership Dues with Applications
- Joliet To Be Replanned
- New Bulletins
- Recently Issued Printed Matter

The Increase in Postal Rates on Second Class Matter 365
Standards for Housing Women Workers 367
Municipal and Civic Publications 369
Methods, Materials and Appliances 375

Two editions of THE AMERICAN CITY are published each month, both containing the same number of pages. The distinction in contents is indicated above. The subscription price of either edition is $3.00. For $1.00 additional per annum, any subscriber may receive both editions; or any subscriber may have his name transferred from the mailing list of the City Edition to that of the Town and County Edition, or vice versa, without extra charge. Canadian subscribers pay 50c extra per year to cover postage; other foreign countries $1 per year extra.

Back numbers of THE AMERICAN CITY are kept in stock by the publishers.

White Trucks

Building Cleveland's First Subway

THE speed of two giant clamshell buckets in removing excavated material from the subway approaches to Cleveland's new $5,000,000 high level bridge was contested by a large fleet of White five-ton trucks, which hauled all the earth and rock to dumping points from one to five miles distant.

In performing this work, the Whites worked day and night for fifteen months. Although some of the ground over which the heavy loads were ha was soft and marked with deep r there was no delay in the progres the work.

In addition to hauling all the e vated material, the trucks also tr ported crushed stone, sand, gr cement, paving blocks, water p lumber, booms, loading bins, boi concrete mixers and other mate and equipment.

White Trucks are built for extraordinary service. They are always selected for the longest hauls and the heaviest work. They have the STAMINA.

THE WHITE COMPANY
CLEVELAND

Largest Manufacturers of Commercial Motor Vehicles in Ame

VOLUME XVIII
NUMBER 4

The American City

NEW YORK
APRIL,
1918

Conserving Capital for War Uses

By Allen B. Forbes
Chairman, Advisory Committee to the Capital Issues Committee

HE Capital Issues Committee and its Advisory Committee are bending every effort to conserve capital for ır uses, and in this they bespeak the rnest coöperation of every municipality the United States. As a matter of fact, ɔm the start it has been regarded as as-red that this coöperation would be ex-ıded unstintingly,—for one reason, be-ıse municipal officials are accustomed to ıtters of public finance and therefore ılize the prime importance of now eli-nating from the security market all new ues which are not clearly essential in this ıe of war; especially is this true as to te and municipal securities, enjoying, they do, the tax exemption advantage ich brings them actively into market npetition with Liberty Bonds.

t is generally understood, of course, that Capital Issues Committee is acting un-voluntary rather than statutory powers. e Committee has relied upon the patri-c coöperation of the country. A resolu-ı adopted by the Governing Committee the New York Stock Exchange illus-ıtes the eagerness to assist in this move-nt to conserve capital for war uses. This olution is to the effect that new capital ıes coming within the scope of the Com-tee's regulations shall not be listed ex-t after the Committee's approval has n received. The Board of Governors the Investment Bankers Association sed a resolution that it was the sense of Board that the members should not or sell such securities unless they had been first approved by the Capital Issues Committee. Most favorable resolutions have been adopted also by the American Bankers Association, by leading chambers of commerce and by similar organizations thruout the country.

As illustrating a movement the spreading of which will do much to serve the Government at this time, there is here quoted the resolution adopted by the League of Kansas Municipalities:

> It is recommended that during the period of the war each and every city government in this state shall undertake only such paving and other improvement work as may be actually necessary to be undertaken at this time; thereby releasing men and money for the service of the National Government.

As a further step in the general war program of the Secretary of the Treasury, the War Finance Corporation bill was introduced in Congress early in the year. This bill, as is known, includes within its provisions the creation of a body charged with the supervision of capital issues. At this writing the measure is still before Congress, and it is not within the scope of this article to refer to it in detail. It seems appropriate to comment, however, that Congress and the Treasury Department, as well as the representatives of business and finance in the country, appear to be unanimous in recognizing the great desirability of the Federal Government's exercising general supervision over the issuance of securities for the period of the war. It is expected that in this way the several states and their

municipalities, and the corporate and other organizations, as well as individuals thruout the United States, may receive practical guidance in the determination of what is essential financing and construction, and what, on behalf of the United States and her allies, can and should be postponed until after the war.

The Committee has adopted the general policy in respect to refunding operations that renewals should be favorably considered except to the extent that the maturing indebtedness can be paid from current funds. The Committee has announced also that a similar policy has been adopted in dealing with the funding of banking debt incurred prior to February 1, 1918.

In respect to state and municipal issues the decision of the Committee has been based primarily upon whether or not the expenditure is a war necessity or is a condition precedent to the maintenance of the health and welfare of a community. The Committee has urged that public authorities, both state and municipal, approve appropriations only where urgently required by these considerations. For many of its war uses, the Federal Government is building temporary structures which will last, say, five or ten years. This example will be followed, no doubt, by many municipalities and states if additional accommodations for schools and the like become imperative. It is clear, of course, that this is no time to build monuments.

Applications for approval of bonds to be issued for new road construction are determined primarily by consideration of whether or not these roads are important from a military point of view or have a marked economic importance, and whether or not results, thru the new construction, may be expected to be obtained approximately within the present year.

The Committee has recently issued instructions as to the data required to be submitted with applications filed with it. Complete copies may be procured from the Committee at Washington or from the subcommittee located in each of the Federa Reserve Districts (headquarters at the respective Federal Reserve Banks). Perhaps the most important point in this circular is referred to in the following quote paragraph:

> In all cases full reasons should be give why the proposed issue cannot be postpone until after the war, or why the necessity i greater than the paramount need of the Nati onal Government in conserving the financia resources, materials, and labor of the countr for the war.

It is obviously impossible for the Capi tal Issues Committee to undertake th supervision of all new security issues re gardless of how small the amount may be It was determined, therefore, that in th beginning the minimum amount of an issu to be submitted to the Committee should b $500,000 in the case of corporations an $250,000 in the case of states and munici palities. Subsequently it was decided t reduce to $100,000 the amount of state an municipal issues upon which the Committe would advise as to whether or not the issu ance of such securities is compatible wit the public interest. The minimum amoun applying to corporate issues is to be sub stantially reduced.

But even tho it is a practical necessit to establish a minimum limit, the Treasur Department and the Capital Issues Com mittee have earnestly expressed the hop that the most searching examination wi be made by municipalities, corporation bankers and business men over the entir country before they become party to th issuance of securities of an amount whic falls below the minimum limit set by th Committee. The aggregate of such sma flotations obviously is enormous. In th present situation, it is the belief of th Treasury Department, as well as of th Capital Issues Committee, that it becom practically an issue of patriotism to app the yardstick of necessity alongside ea proposal to use new capital, regardless amount, and to abandon the project if it not clearly essential.

Under this heading is being published during 1918 *in* THE AMERICAN CITY *a series of articles on Central and South American municipalities, thru the courtesy of the Pan-American Union. The Pan-American Union is the international organization, with headquarters in Washington, D. C., maintained by the twenty-one American republics for the development of good understanding, friendly intercourse, commerce and peace among them. The next two articles of this series will deal with municipal conditions in Lima, Peru, and Mexico City.*

Santiago: The Heart of Chile

IT is just 377 years since Pedro de Valdivia with his band of 150 Spanish soldiers and adventurers founded Santiago, the first town in Chile, at the foot of a rocky eminence near the center of a beautiful level plain in the heart of a country of magnificent mountains. That plain, or central valley, stretches out over 40 miles in length with an average width of about 18 miles. Toward the east, about ten miles from the eminence or hill, rise abruptly the peaks of the Cordillera de los Andes, some of them over 18,000 feet in height, while toward the west, not quite so far away, the Cordillera de la Costa bar the way to the Pacific Ocean.

A Picture of the City

The plain in which Santiago is located is a veritable garden spot. The rich soil, healthful climate, advantageous location, and the mineral wealth of the nearby mountainous region soon attracted large numbers of colonists, and the little city grew rapidly.

The collection of primitive mud huts at the base of the "Huelen" hill in Valdivia's time has developed into a cosmopolitan city of 400,000 people.

Santiago is more distinctly Spanish in sentiment, custom, and social usage than are the cities of the east coast of South America. A single evening spent in the Plaza de Armas will bring that conviction to the mind of even the most casual observer. This handsome square, laid out by the founder of the city some 375 years ago as the "Plaza Mayor," is still the center of the city's life during the balmy evenings of the Chilean spring, summer, and fall. The fine shade trees, interspersed with palms, firs, orange trees and oleanders; the profusion of semi-tropical plants and shrubs; the paved walks bordered here and there with beds of bright and fragrant flowers; and the cool green of the grass plots, make a picturesque setting for the scene, when the dark-eyed señoritas, invariably accompanied by their mothers or chaperons, promenade gracefully and leisurely in an endless procession around and around the encircling paseo. Promenading in an opposite direction are the admiring youthful cavaliers of the capital, many of them in the striking uniforms of the Chilean Army and Navy. Here friends and acquaintances meet to spend a social hour or two, and the numerous seats are occupied by the older people who come to hear the excellent military band and to watch the promenaders, while they discuss the news and events of the day.

On the four sides of the Plaza are several handsome buildings, the most inter-

SCENE IN SANTIAGO, CHILE, WITH THE CORDILLERA AS A BACKGROUND

esting, perhaps, being the cathedral, which stands on the west side on the spot where the first humble little wooden church ever built in Chile was erected by Valdivia's men. Independent of its handsome architectural features, this religious edifice is of great interest because of the historic and intrinsic value of some of the treasures it contains.

Immediately adjoining the cathedral is the palace of the Metropolitan Bishop of Santiago, also a handsome structure. On the north side of the Plaza are the central post office and the historic buildings of the Intendencia and municipal offices. On the south and east sides of the square are the Portal Fernandez Concha and the Portal MacClure, buildings whose lower stories are constructed in the form of arcades, in which are numerous retail stores, shops and stalls, where are to be found potted plants and cut flowers and some of the most delicious fruits grown in the Americas.

In addition to the open squares and plazas, Santiago has three handsome public parks, viz.; the Parque Cousino, the Parque Forestal, and the Cerro Santa Lucia. Handsome shade trees, beautiful driveways, beds of gorgeous flowers, fountains and statues grace the first two mentioned, but other metropolitan cities have similar playgrounds for their people. Santa Lucia, however, that historic hill once known as "Huelen," is the culmination of things beautiful and interesting in the Chilean capital, and must needs be seen to be appreciated.

Santa Lucia

It was Don Benjamin Vicuña MacKenna, one of Santiago's greatest benefactors, who was responsible for the transformation of the rugged mass of projecting basaltic rock, once Valdivia's fort and subsequently for many years used as a sort of potter's field and burying ground for non-Catholics, malefactors, and the poor of the city, into the delightful pleasure resort of to-day. It is located in the northeastern section of the city, near the head of the famed Avenida de las Delicias, the fine boulevard that divides the capital into two parts. The

ornate and stately entrance, with the broad, graceful sweep of its stairways, its curving terraces, its pavilions, domes, and statues, is itself one of the most striking architectural features of the city. A broad flight of steps leads from the Alameda to the massive iron gates, on both sides of which stand marble columns surmounted by bronze statues of soldiers in armor holding aloft the electric arc lamps which light the circular esplanade within. In the center of this enclosure is a large basin covered with water lilies; the water is furnished from a fountain whose constantly falling showers on festive occasions are lighted by an electric device beneath, giving an effect of falling drops and sprays of light that is strikingly beautiful.

Leading from the main entrance, a circling and gradually ascending carriage driveway skirts along a succession of terraces, stone stairways, rustic bridges, and occasional kiosks, until it stops about halfway to the top in a wide terrace. Here is located a spacious open pavilion, provided with comfortable seats for loungers and a number of tables and chairs where the visitor may refresh himself with cooling drinks and delicious dishes prepared by the café. During the pleasant evenings an orchestra provides music for the entertainment of the guests and for the benefit of those who care to dance. Not far from this terrace, a little higher up on the hill, stands the handsome mausoleum of Don Benjamin Vicuña MacKenna, in which rest the remains of the designer and donor of this exquisite pleasure resort. Just before reaching the terrace on one side of the driveway may be seen a small, heavy, wooden door, apparently built into a solid cliff of rock. It leads to a most interesting subterranean chamber—the seismographical observatory of Chile.

From the terrace the summit is reached by beautiful shaded paths which wind gradually upward between dark masses of trees and banks of gorgeous blossoms and flowering shrubs, with here and there cool grottoes and shady nooks provided with benches, along small cliffs from which trickle little streams of water and miniature cascades, side paths sometimes leading to small terraces from which views of the city may be had, until finally the visitor reaches the circular kiosk at the very top. Here, at an elevation of a little less than 400 feet, he secures a superb panoramic view. Around the base of this pedestal clusters the city with its spires, steeples, turrets, domes, and towers, its open squares and straight streets, while

THE CITY HALL IN SANTIAGO

beyond it to the east and northeast rise the white peaks of the Andes. To the west the Cordillera de la Costa bounds the view, its rugged peaks being somewhat lower than the Andean giants, while toward the south the level plain extends as far as the eye can reach, a succession of green fields, regularly laid out farms, and wide meadows on which graze great herds of cattle and droves of horses, a picture of peace and plenty.

A Boulevard and Its Monuments

Another of the prominent features of the city is the Avenida de las Delicias alluded to above. This boulevard traverses the city in practically a straight line for a distance of over three miles, having an average width of 325 feet or more. On either side runs a broad driveway for carriages and automobiles, flanked by some of the finest residences and modern business houses; inside these driveways come the tracks of the street railway, while the wide middle portion of the boulevard is taken up by the "paseo," or walk for pedestrians. This is almost a succession of little parks, flower beds, shrubs and plants, and at short intervals are placed busts, statues, and monuments commemorating the country's great men. So numerous are these statues that the Avenida has been aptly called Chile's "Hall of Fame." Four rows of fine poplar trees, extending almost the entire length of the boulevard, divide the sections devoted to the several modes of travel referred to, from one another.

Among the prominent monuments that adorn the Avenida, in addition to the commemorative busts and smaller statues of various noted patriots, military heroes, scientists, and philanthropists, are three of special note. The first of these is the equestrian statue of General Bernardo O'Higgins, the hero of Chile whose military genius was a powerful factor in gaining for the country its independence. The second of the great monuments is the equestrian statue of General José de San Martin, the "Hannibal of the Andes," who came from his native Argentina with a body of troops over the great Cordillera and jointly with O'Higgins defeated the Spaniards in the decisive battles that gave Chile her independence. The third of the series is the memorial statue of Don Benjamin Vicuña MacKenna, historian and philanthropist, whose constructive efforts to beautify his beloved city gave it the Cerro de Santa Lucia, the Parque Forestal, and the canalization of the Rio Mapocho, and whose literary genius has given to posterity the story of his country's heroic history. The paseo of the Alameda is a favorite playground for the children.

Public Buildings

In addition to the public buildings referred to in connection with the description of the Plaza de Armas, there are many other handsome edifices, both public and private. Among them may be mentioned the Palacio de la Moneda, once the home of the national mint but now the official residence of the President of the republic as well as the location of the offices of the ministries of the Interior, Justice, Finance, and Foreign Affairs. It is a massive structure of stone and brick and is said to have cost nearly $1,500,000. The exterior has remained practically unchanged from colonial times, but the interior has been remodeled and is furnished in sumptuous modern style. In it are preserved some of Chile's most historic relics, noted paintings, and fine specimens of sculpture. The Congreso Nacional, or national capitol, is of combined Doric and Corinthian architecture, spacious and luxuriously furnished and admirably suited to its purpose, that of housing the National Congress which meets there to enact national legislation.

A third building that is especially noteworthy is the new Palacio de Bellas Artes, located in the Parque Forestal. The interior is excellently adapted to the purpose of serving as an academy of fine arts and as the home of a fine collection of statuary, paintings, and other works of art, many of which are the products of native Chilean sculptors and artists. Incidentally, in one of the wings of the building are to be found some fine specimens of the work of such famous artists as Guido Reni, Corot, Van Dyke, Rivera, Jordaens, Rubens, Murillo, Caravaggio, Fragonard, and other masters. Another interesting structure is the National Museum in the Quinta Normal, in which are to be found collections illustrating the geology, fauna, and flora of Chile, as well as archaeological specimens of great scientific value. Other handsome

buildings are the Municipal Theater, numerous ecclesiastical structures, and such educational institutions as the Instituto Nacional, the School of Medicine, the Escuela de Artes y Oficias, the Normal School, the Military Academy, the Arsenal and Military Museum, and many others.

Public Utilities

One of the chief factors that make for the health and comfort of the people of a large city is its water supply, and with this essential Santiago is remarkably well provided. The cool, crystal-clear liquid that immediately impresses every visitor to the Chilean capital has its several sources in the Andean heights. It comes from three different places, the ravine of Ramon, the Vitacura waterfalls, and the Lago Negra. The last named source, a beautiful, clear lake located in the Andes about 33 miles from the city, at an elevation of 8,790 feet above the level of the sea, has only recently been added to the other sources of supply, and assures the city of practically an unlimited amount of pure drinking water at all seasons of the year. The city is furthermore supplied with an excellent drainage system, while successive administrations have in recent years spared no expense in the paving and up-keep of the streets.

The city has an excellent electric street railway system. It is fairly covered with a network of 33 lines belonging to as many different routes. The cars are nearly all "double-deckers," and the fares for passengers in the upper deck are less than for those in the lower. Nearly all the conductors are women, very businesslike and efficient, while the drivers are still motor-"men." It is said that the women were first employed because of a shortage in available male workmen during Chile's most recent war, and that they proved so satisfactory that the company subsequently retained them.

SANTIAGO'S MUNICIPAL THEATER

Schools and Hospitals

Santiago is well supplied with educational institutions of every kind. At the head of the entire system are the University of Chile and the Catholic University, which confer the usual literary, scientific and certain professional degrees,

and in whose faculties are to be found men of international reputation in literature, science, law, etc. Excellent secondary schools prepare students for the higher studies of the universities. The Government supports over 200 free elementary schools in the city, 45 schools of higher grades, 5 lyceums, 6 institutes, 4 normal schools, and 12 professional schools. There are also a large number of private institutions that receive subventions from the Government, among them being 70 free elementary schools, 40 colegios, 12 lyceums, 10 institutes, 2 normal and 2 professional schools.

The city is noted for its hospitals, all under the jurisdiction of the Junta de Beneficencia. The oldest of these is the Hospital of San Juan de Dios, an emergency hospital for men. The Hospital de San Francisco de Borja, founded in 1776, is reserved for women and can accommodate 700 patients. Connected with the celebrated School of Medicine is the Hospital de San Vicente de Paul, for both men and women. The largest hospital of the city, completed in 1905, is the Hospital del Salvador, which accommodates 1,200 patients. The Hospital de San José, with 350 beds, is mainly for the treatment of tuberculosis. There are also two excellent children's hospitals, the Hospital de Niños and the Casa de Huérfanos, and an admirably equipped insane asylum for both men and women.

The Municipal Government

Under the organic law for the incorporation of towns and cities, passed by the National Congress in 1891, and amended by the act of December 18, 1914, each municipality in the republic is governed directly by three alcaldes and six councilmen or aldermen. In cities whose population exceeds 100,000 there is an additional councilman for each 50,000 in excess of that number, so that Santiago has three alcaldes and ten councilmen. The Intendente of the province is the presiding officer of the council, when present at its meetings, and while he has no vote is given a veto power or power of suspension of any act or resolution passed by the Council which may be prejudicial to the public order. In the absence of the Intendente the First Alcalde presides over the sessions of the Council, and in reality at all times discharges practically all the duties that devolve upon the mayor of a city in the United States. The three alcaldes are elected by the Council and are ranked as First, Second, and Third, in accordance with the number of votes received by each. In the event of the death or other disability of the First Alcalde, the Second assumes his duties, and in the event of his disqualification the Third stands ready to take the place. The councilmen are chosen by popular election; they must be citizens over 21 years of age and have resided at least five years in the municipality, must have no personal interest in national or municipal contracts or supplies, and must hold no other public office or commission.

In addition to the three alcaldes the Council elects a secretary and a treasurer of the city. The powers and jurisdiction of the Council are very comprehensive, the entire government of the city being in its hands, subject only to the provisions of the national constitution and the restrictions imposed by the organic act governing the creation of municipal corporations, referred to above. The work of administration is divided among a number of departments, the principal ones being the Treasury, Direction of Public Works, the Inspection of Municipal Services, the Board of Health, Department of Parks and Gardens, and the several departments of Markets, Public Slaughterhouses, and the Junta de Beneficencia, or Public Assistance.

Industrial Development

Especially since the exigencies of the European war have made the importation of many necessary commodities difficult and expensive have the leading capitalists and business men of Santiago turned their attention to promoting manufacturing. In the Anuario General de Chile for 1917, it is stated that in the capitol city there are 1,232 manufacturing establishments with a total capitalization of over 103,000,000 pesos (a Chilean paper peso equals about $0.25 U. S. currency). The Chilean Industrial Exposition, held at Santiago in September, 1916, was a revelation to the world of the progress of Santiago and the country generally in manufacturing.

Municipal Finance—Its Relation to Pavement Construction and Renewals*

By George C. Warren

THIS topic is one of the most important in its relation to the continued call for more and better paving thruout the cities of this country. It has been neglected on account of the tendency to let work continue under the systems in vogue a quarter to a half century ago. These may have been adequate at the time, but changing conditions have made them obsolete and uneconomic. Many localities have patched up their old systems rather than face the issue, so that in many places the financing of pavement work is unnecessarily costly.

Systems of Financing Street Improvements

The several systems of finance for street improvement in the order of their undesirability, as the writer sees them, are:

I. The municipality pays the entire cost: (a) On a bond basis; (b) on a cash basis.

II. The municipality assesses the whole or a portion of the cost on the abutting property improved by the pavement: (a) Cash; (b) on a deferred payment or installment plan.

I. MUNICIPALITY PAYS ENTIRE COST

If the original cost of pavement and renewals is paid by the city out of general funds, it necessarily means that streets so paved and maintained probably do not meet the demands of the public; a high tax rate is forced on the public; or a high bonded indebtedness is accumulated, with which municipal officials must reckon sooner or later.

In some cities the scheme has been to assess abutting property owners either the whole or part of the first cost of the pavement, the city paying for maintenance and renewals. The weak points in this system are that property owners have a tendency to urge the cheapest possible pavement, and it only temporarily overcomes the difficulties of repaving and increased general taxes and bond issues.

II. BY SPECIAL ASSESSMENT

There are many different systems of payment in the "special assessment" class. In St. Louis, Mo., the entire cost of all street pavements and renewals is assessed on the abutter, and the contractor is given "tax bills" bearing six per cent interest against each individual property owner. These bills are salable only at a heavy discount because of the amount of red tape necessary to collect them. If they were guaranteed and sold by the cities and the contractor paid cash, the taxpayers would be saved a considerable portion of the interest rates, while the city could sell them at par or a premium and save in lower contractor's prices thru the elimination of discounts and collecting charges now met.

A Method of Equitable Apportionment of Costs

One of the most difficult governmental problems is the equitable apportionment of taxes, and even under the very fairest system yet devised there are bound to be some inequalities. From an extensive experience in the contracting field, the writer has devised the following scheme, which is offered to municipalities for consideration.

Assess between two-thirds and three-quarters of the original cost and the cost of renewals and resurfacing against the abutting property, for this property is directly improved in value and comfort much in excess of the cost of such assessment. The general public has the use of the streets, and therefore should pay a portion of the original costs and costs of renewal. The city from its general funds should pay the entire cost of minor repairs up to the time of resurfacing or entire renewal, except that portion borne by the contractor thru guarantees or clauses in the paving contract.

No bonds or municipal paper should be issued to cover the general tax or the special assessment portion of the pavement cost for a term greater than the reasonable length of life of the pavement with a good factor of safety. It is better to have the pavement fully paid for before it is worn out than to have several pavements unpaid for on the same street.

* From a paper read before the American Society of Municipal Improvements.

The assessments should be absolutely payable in annual instalments with interest, with the privilege on the part of each taxpayer to pay in cash within a month after the levying of the assessment. Serial bonds are the preferred method of paying that portion which is paid out of the general funds of the city. It is understood that no bond issue should be made without an adequate plan for annually raising funds to meet the bonds on maturity.

The rate of interest on the paper sold should be high enough so that they will sell at par or better, and then this money may be used to retire part of the bonds at the first legal opportunity, without loss. The rate of interest to the abutter on special assessments should be within one-half per cent as low as the city pays on the bond, as this is ample to pay the cost of collection and possible loss on irregular assessments and is reasonable to the abutter.

The city should pledge its credit for the payment of its special assessment bonds. This can be done without loss, because it is secured by the assessments which are a first lien against property far more valuable than the amount of the assessment. The special assessment bonds, as well as general bonds, should be issued in round amounts payable at certain dates with coupons covering both interest and instalment payments of principal. The dates on the assessment bonds should be about one month after the due dates of the corresponding assessments, as this gives the city one month to "exercise the power of law" against any taxpayer who defaults on prompt payment of any assessment.

The city of Utica is a shining example of the value and practicability of this plan, for it has used very much the same scheme for twenty-five years. The city pays one-third the cost of original pavements and all renewals and provides for this out of the annual tax budget, the paving fund thus created being an annual tax of less than one dollar per capita. The work of paving the city has been carried on without being a burden to anyone, and no one can deny that Utica is an example of a well-paved city.

The Importance of Inspection of Paving Materials

By Messrs. Morgan Campbell & Nolte
Engineers for Robert W. Hunt & Co.

A PROMINENT engineer once said, "The man who is building for all time owes it to himself not to take a chance with materials of unknown value, but to insist on the best materials that can be bought," and undoubtedly most engineers fully realize that the efficient and economical way to secure the best materials, whether for paving or other construction, is thru competent and thoro inspection, preferably at point of manufacture.

Millions of dollars have been expended not to the best advantage thru lack of knowledge of the peculiarities of paving materials, and millions more have been entirely wasted. Large quantities of materials are used every year without being inspected and tested, a most unwise, not to say dangerous, practice. Men and corporations who know best never indulge in such chances. The most carefully managed corporations, the great railroads and the great cities of the country, insist upon inspection and tests of all their purchases, and it would seem that the smaller cities, states, counties and other purchasers could hardly afford to be less economical.

Portland Cement Concrete

Portland cement concrete is an artificially made conglomerate composed of large and fine aggregate—that is, broken rock or gravel and sand—held together in a hard, stony mass by Portland cement, which sets or hardens when mixed with water. For a good concrete it is not only necessary to secure a fit cement, but it is of the greatest importance that action be taken to insure a proper selection and proportion of the rock, or large aggregate, and the sand, or fine aggregate.

When concrete is made of the proper materials, properly proportioned, handled and placed, it is of almost inestimable value as

a construction material. In so far, however, as it lacks any one of these requisites, it is proportionately unsafe or even dangerously worthless. In none of the various fields of its use is this more true than in permanent road construction, and in this field its employment has increased with a rapidity that is marvelous. It is the accepted base for all permanent road construction, brick, asphalt and creosoted block. In concrete roads it fills the functions of both base and surface.

The inspecting and testing of cement may be on carload or bin lots at mills or in warehouses, or when delivered on the work. This inspection practice has been definitely standardized and sanctioned by the leading engineering societies.

The testing of the aggregate should be made in laboratories to determine its suitability. The general character of the material, the grading and the cleanness are most important. Determinations should also be made to obtain the best possible and most economical mixtures.

Asphaltic Pavements

Asphaltic pavements, whether they are sheet asphalt, asphaltic concrete or bitulithic, are all inspected in the same way. This work covers the inspection and testing of the aggregate and the asphaltic cement, or the refined asphalt and flux used in making the asphaltic cement. The first essential in preparing the materials for asphaltic pavements is to be assured that the aggregate be suitable and properly graded. The function of the asphaltic cement, which is only a small part of the total payment, is to cement together the integral particles of the aggregate. If too much asphaltic cement is present, the pavement will be slushy; if not enough, the pavement will be hard and brittle and liable to disintegrate under traffic or extremes of temperature.

Asphaltic cement should be analyzed and tested for assurance that it fills the requirements of specifications, which include determination of penetration, loss by heating, solubility in various solvents and other tests to determine the suitability of the asphaltic cement for purposes for which they are intended, and with a view to preventing failure in the finished pavement.

There are many causes of failure in sheet asphalt pavements, a few of which may be mentioned: in the foundation—insufficient drainage, insufficient depth, construction of unstable or disintegrating material; in the binder course—poorly graded or inferior stone, excessive asphaltic cement, causing bleeding, insufficient asphaltic cement, asphaltic cement not possessing refined properties, overheating of stone or asphaltic cement laid when material is cold or on a wet base; in the surface—sand of poor quality, improperly graded, overheated or insufficient fine material, asphaltic cement not possessing refined properties, excessive or insufficient amount or overheated, asphaltic cement laid when material is cold on wet binder course, not compact, poor grading of crown.

Brick

It is well recognized that the proper place to inspect paving brick is at the manufacturing plant, and that a trained and experienced inspector should be employed who will observe the different steps of manufacture and give careful attention to seeing that the brick are properly burned and tested in accordance with the specifications.

During the last seven or eight years, several methods of testing brick have developed, but by far the most important and significant test for paving brick is the abrasion or "rattler" test. The conditions of this test approximate more closely than all others the actual conditions of service. From this test an idea can be obtained of the effect of impact of horses' hoofs, the pounding of vehicle wheels and the abrasion due to the slipping and sliding of horses' hoofs and wagon tires. Different conditions of service and severity of traffic may require brick of varying abrasive quality. Brick suitable for some paving purposes might be quite unsatisfactory under other conditions; hence the need for careful and comprehensive testing.

Creosoted Wood Block Pavement

Creosoted wood block pavement has been gaining in favor in cities and towns, on account of its sanitary qualities, durability, ease of repair, smoothness under traffic, noiselessness and ease of cleaning. Most of the troubles that have developed in the large use of wood blocks for paving may be attributed to expansion or bulging of the pavement, bleeding of the preservative or failures due to improper foundation. A good pavement will depend on three fac-

tors: material, treatment of materials, and laying.

To obtain a long life for wood block pavement, it is necessary that the timber used should be sound and of uniform structure, and be properly treated with a suitable preservative, and that the blocks should be laid on a good base, impervious to ground water, with suitable provision for expansion caused by absorption of water from rains.

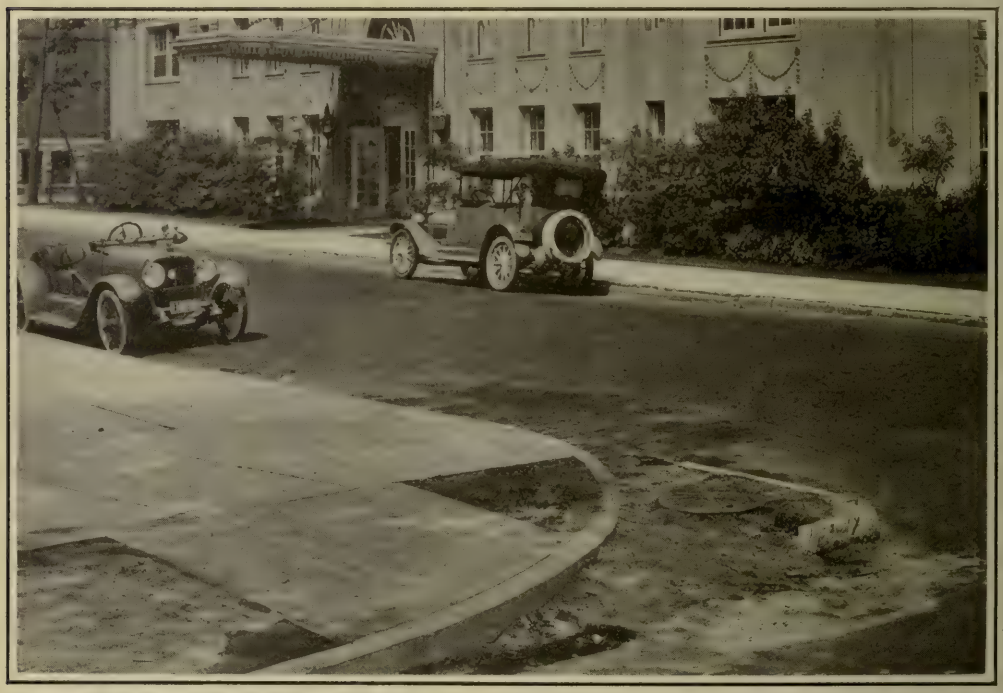
Engineers and contractors will find not only that careful inspection and testing by experienced and trained inspectors and chemists will be of infinite value in giving assurance that they are using the best and most suitable materials in their paving work, but they will find also that the cost of such precautions and investigations is comparatively small and in no way commensurate with its value to them in the actual saving of expenditure.

Long Radius Curbs for Greater Safety

MANY cities thruout this country have realized the danger of building curbs with very short radii at street intersections. These communities are taking steps to replace the former curbs with concrete or granite curbs of greater radius; in some instances as much as eight-fold.

Vehicles approaching a corner where the curb is almost pointed always tend to swing into the middle of the road in order to make a wide and safe turn. This forces them into the path of approaching vehicles on the cross street—a dangerous situation.

The accompanying illustration shows a change made at the intersection of Lake Shore Drive and Division Street, Chicago, which is in the interest of safety. The original curb, the location of which can be readily seen in the illustration, had a radius of 1½ feet, while the new curb has a radius of 14 feet, thus enabling automobiles and motor trucks in particular to make the turn with complete safety to all vehicles without an undue reduction of speed and without getting into the path of the traffic on the cross street.



Courtesy of Universal Portland Cement Co.

THIS CURB RADIUS WAS CHANGED FROM 1½ FEET TO 14 FEET, WITH SUBSEQUENT INCREASED SAFETY TO ALL TRAFFIC

The Lighting of New York City's New $3,000,000 Garbage Disposal Plant

By A. L. Powell
Edison Lamp Works, Harrison, N. J.

THE Metropolitan By-Products Company has recently placed this modern plant in operation at Green Ridge, Staten Island. It is said to be the largest in the world, and when operated at full capacity can handle 2,000 tons per day, which will take care of the refuse from Manhattan, Bronx and Brooklyn.

The artificial lighting, as well as every other detail of the plant, was the subject of careful design.

Modern chemical engineering has done great things in the line of hygienic disposal of refuse. It is no longer necessary to carry refuse out to sea to be dumped overboard and then by the action of the waves gradually brought back to shore. By the careful application of scientific processes this cast-off material can be partially reclaimed, and, more important, rendered inoffensive and harmless.

This gigantic, well-constructed plant is evidence that sufficient by-products can be produced to make it a profitable venture. These are grease, dried tankage (which when ground forms an excellent fertilizer), and a certain amount of metal.

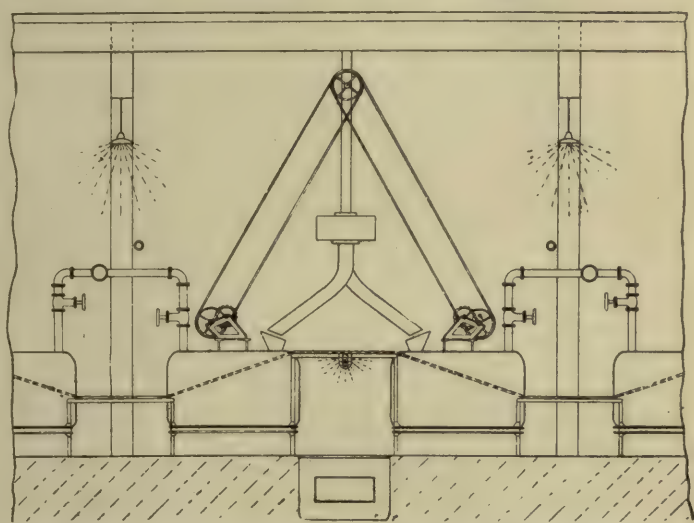
The method of disposal is one of straight dehydration. There is no digestion carried on to give odors, and no chance for unpleasant smells if there are no leaks in the piping system. The product, as it comes from the reducer house, is dry and sterile.

Every precaution is taken to avoid the system's becoming a nuisance. The raw garbage is delivered in huge barges so constructed as to prevent the discharge of any of the water drained from the garbage, and carefully covered with a special canvas apron to prevent any from falling off.

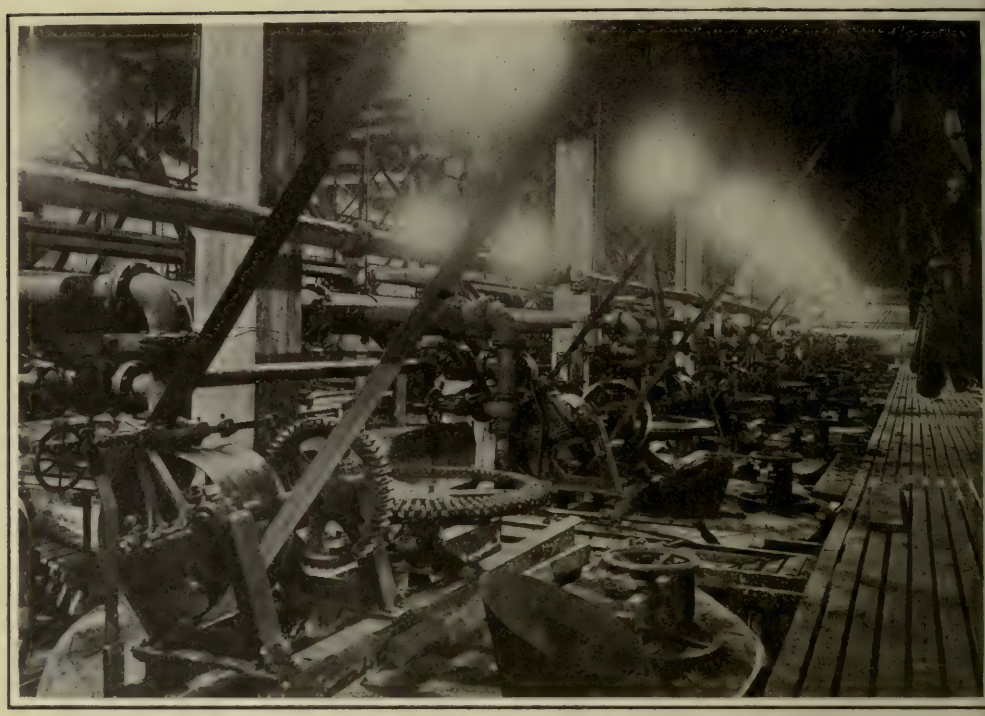
The garbage is unloaded by steam hoist grab buckets, and delivered to closed conveyors of the steel scraper type, which carry it to the main building where the reducers are located. A brief description of the general method of reclaiming the by-products from the garbage is given in a paper presented by Gustave R. Tieska before the American Society of Municipal Improvements, November 11, 1916.

In this plant the Cobwell process is used. Conveyors distribute the raw garbage to the reducers, which are then sealed air-tight. A solvent is next pumped in and steam admitted to the jacketed walls. Gasoline is ordinarily used as a solvent, but here a special kerosene distillate is employed.

An agitating device is constantly turning, and the charge is "cooked" until the solvent and the water evaporate. These vapors are drawn off to a condenser, and there again assume a liquid state. This liquid is pumped to a closed tank, where the solvent



ELEVATION OF PORTION OF NEW YORK'S REDUCER PLANT, SHOWING ARRANGEMENT OF REDUCERS AND LIGHTING



NIGHT VIEW OF REDUCERS, SHOWING MAZE OF STEAM PIPING AND NETTING, AND, IN SPITE OF THESE, THE EXCELLENT ILLUMINATION THAT HAS BEEN OBTAINED

and water separate by gravity. The solvent is drawn to a storage tank and the water discharged into the adjacent stream.

When the garbage has been dried by this method, fresh solvent is pumped into the reducer to dissolve the grease. After picking up the grease, the mixture is drawn to an evaporator of the vacuum type. Vaporization separates the solvent from the grease. The former, after being liquefied in a condenser, is ready to be used again.

After the grease has all been extracted from the garbage, the jacketed walls are again filled with steam, and after being thoroly dried the tankage is removed from the reducer and conveyed from the building by belted conveyors, ground in pan mills, and screened by rotary screens. This tankage or fertilizer is then stored and finally automatically conveyed to the loading vessel through swivel spouts.

Reducer House

The main building is a one-story structure 30 feet high, 200 feet wide, and 330 feet long. When completed, this will contain 250 reducers 8 feet in diameter and 4 feet high. Each unit has a capacity of from 8 to 10 tons per 24 hours, depending on the steam pressure used.

The reducers are arranged in rows facing each other, as shown roughly on the plan and elevation of a small portion of the plant (p. 301). Between the rows a walk is provided for the operators. From here the valves and other mechanisms are controlled. There is also a higher runway at the rear for the workmen who fill the tanks from the overhead conveyors.

The night view of the reducer house, above, shows one of the conveyors for raw garbage at the extreme right. It is also seen that there is a veritable maze of piping for steam and solvent, and transmission machinery or belting. This multiplicity of overhead structures complicated the lighting problem and made a careful analysis necessary. Lighting units had to be so placed that dense shadows were avoided. The requirements for lighting were as follows:

1. Sufficient general lighting for safety. The workmen must be able to move about the plant without the liability of stumbling over piping, falling off the runway, or being caught in the moving parts.
2. Adequate illumination for the operation

of valves, belt shifters, reading of steam gauges, etc.

3. Suitable spread of the light so that the conveyors can be inspected, and the reducers loaded and emptied.

4. The operators are required to keep a log or record of each charge. This is done on a tabulated sheet attached to a board at each reducer. These data must be readily discernible at all times. Needless to say, if this requirement was met by general lighting, there would be adequate illumination for the first two items.

5. Some special arrangement was required to light the inside of the tanks so that the charge could be inspected while being "cooked."

Method of Lighting

As shown in the plan, a row of outlets was located on the beam above the walk along the front of the reducers, for here a minimum of obstructions existed. One outlet was placed in each bay giving a spacing of approximately 20 feet by 30 feet; 200-watt Edison Mazda C lamps with dome shape (distributing) porcelain enamel steel reflectors were used, giving a specific power consumption of ⅓-watt per square foot of floor area. The average illumination intensity is in the neighborhood of 2-foot candles.

This equipment and arrangement fulfill conditions 1, 2, and 4. There is sufficient spread of light to illuminate the conveyors and charge the reducers. The night view (p. 302) is taken from the runway under the conveyors and gives a very good idea of the illumination.

The reducers are emptied through the doors at the rear. The dried tankage is raked out and falls on a belted conveyor beneath the floor proper. This arrangement is shown below. Special lighting was required here, as the runway obstructed the rays from the overhead units. The lower conveyor is normally covered with loose planking, and if this space is not fairly well lighted there is great danger of stumbling over misplaced boards or stepping into openings. For example, in the foreground of this picture can be seen a board in an almost upright position.

A central row of outlets is provided, and 40-watt Edison Mazda lamps with wire guards are placed on 20-foot centers. These are close to the walk, about 7 feet above the floor. Advantage is taken of this line of wiring to provide a means of attaching portable lamps for use when repairing or inspecting the interior of the reducers.

The line of conduit passes thru a circular receptacle box having a porcelain socket. From the side of this box a line of pipe, after being bent downward, terminates in the female portion of a plug attachment. This permits any of the tanks being reached with a portable lamp.

RUNWAY BETWEEN REDUCERS, NEW YORK GARBAGE DISPOSAL PLANT
Under the loose flooring is a belt conveyor which carries off the dry tankage raked out thru the doors. Good illumination is required here on account of the uneven surface of the flooring

To light the interior when in operation, two openings with suitable projections are cast in the top of the tanks. These are placed at such an angle that the light entering one is specularly reflected from the surface of the charge to the second opening. These are kept steam tight by means of reënforced glass plates and suitable gaskets.

In one opening is placed a parabolic shaped polished aluminum reflector with an opening the size of the glass plate mentioned above. A bayonet candelabra socket is protected by a wooden cover, an extension on which serves as a handle. A 6-volt, 12-candle power Mazda C automobile headlight lamp was found to furnish enough light.

A flexible conduit extends from the lamp to a push switch near the other opening. When the operator wishes to observe the condition of the charge, he peers in at this opening and presses the switch. Such an arrangement is desirable on account of the intermittent requirements.

Boiler House

Adjoining the main building is the boiler house, with water tube boilers of 7,500-horsepower capacity; 200-watt units are placed about 18 feet above the floor on the wall opposite the firing doors. These are installed at an angle so that the maximum light is directed toward the boilers, yet there is sufficient downward light to illuminate the coal heaps and tracks.

Outlying Buildings

General illumination of a suitable intensity is provided by 100- and 200-watt Mazda C lamps in dome reflectors in the machinery building, where are located the pumps and the blacksmith, machine, and pattern shops.

In addition to the main building, which has been described in detail, there are a number of storage buildings, condensers, evaporators, and storage tanks. The latter have a capacity of 400,000 gallons of solvent, and 14,000 barrels of grease. Their lighting requirements are not at all exacting.

Yards

For lighting the yard, units have been so located that practically all the outdoor spaces are illuminated, and no shadows cast by the buildings. Some of these lamps are held by brackets attached to the buildings, and in outlying portions poles are erected. Medium-size Mazda C lamps are used with weatherproof equipment, giving a wide spread of light.

At regular intervals along the conveyor structures iron pipes are erected with curved tops which support 100-watt Mazda C lamps in distributing reflectors.

Several flood-lighting equipments are advantageously placed, with the beams so directed that construction work and the loading of barges is facilitated.

The fact that the plant operates continuously, with three shifts of eight hours each, makes artificial lighting of much importance, and it is fitting that the matter should have received such careful attention, for very frequently plants which operate under similar conditions are erected where the lighting is apparently an afterthought, and more or less of a makeshift system is in use. In many chemical plants, for example, every attention is given to the arrangement of machinery, and all details of the chemical processes are very carefully planned in advance. The designing engineer is prone to look at his technical side of the question as of importance, and neglects to provide means by which the human factor can operate at maximum efficiency. Proper artificial lighting has been proved to be a most important element in plant construction. No matter how perfectly a system may be worked out from a mechanical point of view, this advantage will be offset if the men who operate the plant cannot work effectively.

Editorial Note.—For the foregoing material, acknowledgement is made to the *General Electric Review*.

The Swimming Pool and Its Operation

By J. J. Hinman, Jr.
Water Bacteriologist and Chemist, State Board of Health Laboratory, Iowa

SINCE it has been shown that swimming pools may be the cause of various sorts of infections, intelligent attempts to construct and maintain pools in a really sanitary manner have been steadily on the increase. A considerable number of our educational institutions have required their students to be at least familiar with the rudiments of swimming. With this requirement has come a realization on the part of the faculties that the provision of a safe place for swimming instruction is obligatory on them. On this account, the pools of a number of colleges and universities have been carefully studied. In most of these cases, the tests have been run occasionally or for short periods of time. At the State University of Iowa we have made examinations of the pool waters daily during the time the pools remain open.

Successful pool operation is dependent on three sets of factors:

1. The construction of the pool and its appurtenances
2. The operation of the purification devices
3. The inspection and supervision of the bathers

The Construction of the Pool

The pool should be constructed as a tight tank varying in depth from about eight feet at the deepest point to about three or four feet at the shallow end. The deepest point should not be at one end, but a few feet from it—preferably at the place where swimmers jumping from the spring-board enter the water. Midway on the line of greatest depth should be a drain covered with a perforated plate. The drain pipe should never be less than four inches in diameter, and to facilitate rapid emptying a larger pipe is much to be preferred. The drain pipe should contain valves so arranged that the water taken from the bottom of the pool may be sent to the sewer or pumped to the purification apparatus. A common fault of pools is their tendency to retain the last inch or two of water. There should be a slight slope from the sides toward the center at the deepest point to prevent this. Workmen should not have to be sent in to sweep out the last of the water.

The so-called "standard Y. M. C. A." di-

Courtesy of C. W. Hardy, Physical Director

SPRINGFIELD, MASS., Y. M. C. A. SWIMMING POOL

mensions (60 feet by 30 feet) are popular. This is due to the fact that certain swimming records must be made in a pool at least 60 feet long.

The lining of the pool should be as smooth as it can be made. Glazed brick and tile are widely used for this purpose. If concrete is to be used thruout, a facing made with neat cement should be applied. Cracks and indented lines should be avoided. Ladders and piping should not clutter the sides of the pool. Such ladders as are necessary should be supported so far from the wall that cleaning behind them will be easy. The corners should be rounded, in order that they may readily be cleaned.

There should be a molded scum-gutter, or expectoration trough, on all four sides of the pool. This also serves as a hand rail and makes unnecessary the rails of piping that have been so common. These scum-gutters should be deep and well drained and should not receive the washings from the runway. The scum-gutters should be carefully set, since a difference of one-fourth or one-half inch in height of a gutter will make a considerable difference in the ease with which the floating material may be run off from a pool without undue waste of water.

The runways should be pitched to drain away from the pool. They should extend entirely around the pool and may well be provided with a hand-rail attached to the wall on the side away from the tank.

The Surroundings of the Pool

Many of our older pools were put in dark, basement rooms in which the water appeared of an uninviting Stygian blackness. The later practice is to install the pool in a well-lighted and well-ventilated room provided with a gallery for spectators at the level of the floor above. This has a number of important advantages. The large space—two stories in the clear—relieves the room somewhat of the unpleasant atmosphere, heavy with the odor of sweating bodies. The sunlight allows the bottom of the pool to be visible, if the water is kept clear. This is a matter of great importance, since it allows the attendant to render immediate aid in case of need. In dark or turbid pools it has happened that a swimmer would venture into the pool in the absence of the attendant, be drowned and only be discovered upon the draining of the pool. The opportunity to see the bottom is reassuring to beginners and children. In addition to these advantages, there is the important disinfecting action of the sun's rays to be considered.

The gallery for visitors prevents the carrying of street dirt into the pool room and the runways, from which it would easily be carried into the pool upon the feet of the bathers. Much of the dirt would sink to the bottom to appear as a blackish sediment, which collects rapidly even without this addition. Besides this, a serious bacterial pollution of the pool water may be brought about.

Convenient facilities for shower baths are essential. These may be located in the locker room, either in batteries or in booths and an additional battery of showers should be located in the pool room itself. Where it is possible, the baths should be supervised, since they must be thoro. Baths taken after the swimming suit has been put on are not satisfactory.

Toilets should open off from the locker rooms and also from the pool room itself. The towel room should provide racks for clean suits and towels and baskets for the soiled ones. Skin diseases may be transmitted thru unclean or carelessly handled suits and towels.

Water-Purification Devices

The water in the pool should be clear, of low color and without odor. It should have an agreeable temperature (about 75-80° F.) and should be safe bacteriologically and chemically. To maintain the water in that condition, fresh purified water should continually be added. This is economically done, in most instances, by the use of refiltration and treatment with some sterilizing agent.

In this part of the country, our water-supplies are nearly all quite hard and contain calcium bicarbonate in relatively large quantities. When such a water is heated the bicarbonates break up somewhat, precipitating calcium carbonate and producing a turbid water. The old method of heating—turning live steam into the pool—had this objection, in addition to the tremendous racket produced. It is much better to heat the water in a large steam water-heater and pass it thru a filter before running it into

the pool. A clear water results.

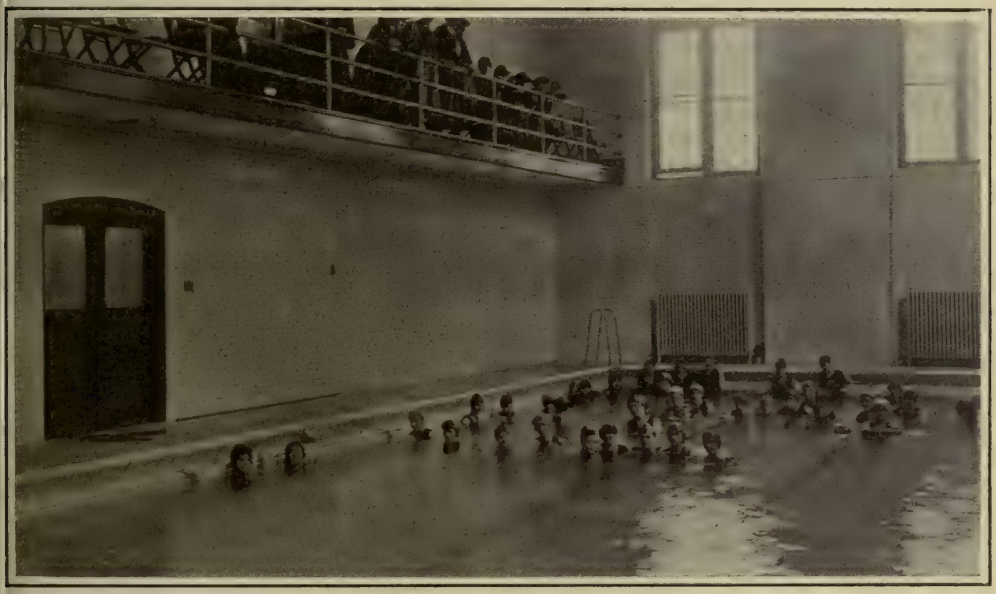
When the water is kept in the tank for three days or a week and replaced with fresh water, the cost of heating may easily run up to several hundred dollars in a year's time. The cost of the water itself is often a considerable item. It is usually more economical on this account to filter the water continuously and use the same water for several months. It is necessary, of course, to replace the water lost on account of washing the filter, evaporation, splashing and other causes.

TYPES OF FILTERS

Any of the types of the rapid sand filter are suitable for filtering pool water, but I believe that pressure filters are more desirable, as they may be insulated, with some consequent saving in heat. The calcium carbonate due to the decomposition of the bicarbonate tends to "lime up" or cement together the sand grains. After a time they may form dense rock-like masses. For this reason a manual agitator should always be provided for the filter, since a reverse current may not be strong enough to break up the sand bed thoroly. It is essential that the sand bed be well broken up when it is cleaned, as otherwise the polluted water will make passages for itself thru cracks in the impacted mass, and will thus pass thru the apparatus without sufficient purification. Some form of a hair-catcher or screen may well precede the filter to prevent organic matter of this sort mixing with the sand.

COAGULANTS

The use of a filter presupposes the addition of a coagulant. The common substance is sulphate of alumina, incorrectly called "filter alum." In order to secure coagulation with this chemical, it is necessary that the treated water be alkaline. The water supplied to our pool has an alkalinity of about 350 parts per million, as calcium carbonate. The reaction with the alum is continually reducing the alkalinity, but we are adding from time to time more or less fresh water to make up that lost in splashing. For this reason, the alkalinity of our pool water has never run down below 200 p. p. m., and we have never had any difficulty with after-precipitation of alum in the tank. We use from two to three pounds of alum per day. In those places where soft waters are filtered, lime water, soda ash or baking soda may be added to make up the alkalinity to the desired point. (The degree of alkalinity can easily be determined by a simple titration with fiftieth-normal sulphuric acid and methyl orange or erythrosine as an indicator.) The alkalinity should



THE WOMEN'S POOL AT THE STATE UNIVERSITY OF IOWA

SWIMMING

City and State.	Maintained By	Capacity Gallons.	Dimensions. Length	Width	Max. Depth	Min. Depth	Users Per Day.	Gallons Per User Per Day.	Temperature °F.	Times Emptied and Cleaned.
Mobile, Ala.	Y. M. C. A.	.....	50′	22′	6′	4′	150	....	70	Once a week
Berkeley, Cal.	U. of C. (Men)	650,000	232′	76′	10′	3′	200	3,250	65–68	4 times a year
Berkeley, Cal.	U. of C. (Women)	131,000	75′	40′	8′ 9″	3′	175	749	70–72	4 times a year
Palo Alto, Cal.	Stanford (Men)	230,000	100′	40′	9′	3′6″	100	2,300	60–72	Every 3 weeks
San Francisco, Cal.	Lurline Baths	325,000	140′	65′	9′	2′	...	....	79–80	2 to 4 times a week
San Francisco, Cal.	Y. M. C. A.	115,000	85′	25′	9′	3′6″	800	144	72	2 times a week
Denver, Col.	Y. M. C. A.	55,000	60′	20′	8′ 2″	3′ 6″	350	157	80	4 times a year
New Haven, Conn.	Yale University	150,000	75′	30′	11′	5′ 8″	350–400	400	78	Once a week
Waterbury, Conn.	Y. M. C. A.	33,000	40′	18′	6′ 6″	2′ 6″	150–200	189	70	4 to 6 times a year
Chicago, Ill.	Central Y. M. C. A.	65,000	66′	22′	8′ 6″	3′ 6″	250–500	173	75	Every 1 to 2 days
Chicago, Ill.	Div. St. Y. M. C. A.	.....	60′	25′	8′	3′	135	....	72–75	Every 3 days
Chicago, Ill.	Y. M. C. A. Coll.	.....	60′	24′	7′	6′	100	....	78	Every 2 to 3 days
Evanston, Ill.	Y. M. C. A.	76,000	60′	25′	8′ 6″	3′ 6″	150	506	76	.....
Peoria, Ill.	Y. M. C. A.	62,000	60′	20′	8′ 6″	3′ 6″	100	620	78	4 times a year
Rock Island, Ill.	Y. M. C. A.	60,000	60′	20′	7′ 6″	3′	200–300	240	75–82	4 to 12 times a year
Evansville, Ind.	Y. M. C. A.	75,000	75′	25′	7′ 6″	3′ 6″	250	300	84	2 times a week
Indianapolis, Ind.	Y. M. C. A.	58,000	60′	20′	8′ 6″	4′ 6″	100	580	68–70	2 times a week
South Bend, Ind.	Y. M. C. A.	.....	60′	24′	8′ 6″	3′ 6″	100	....	75	Once a week
Ames, Ia.	Ia. State Coll.	90,000	60′	30′	7′ 8″	3′	100	900	.....	Irregular
Burlington, Ia.	Y. M. C. A.	60,000	60′	20′	8′ 6″	3′ 6″	25	1,500	76–89	Once a week
Cedar Falls, Ia.	St. Teachers	48,000	55′	20′	6′	4′	200	240	78–82	Once a week
Cedar Rapids, Ia.	Y. M. C. A.	50,000	49′	20′	7′	4′	200	250	.....	Once a week
Clinton, Ia.	Y. M. C. A.	24,000	33′ 6″	17′ 10″	7′ 6″	4′ 6″	75	320	78	Once a week
Council Bluffs, I	Y. M. C. A.	20,000	40′	15′	7′	3′ 6″	35	571	78	2 times a week
Davenport, Ia.	Y. M. C. A.	55,000	60′	20′	7′ 6″	4′	100–450	200	80	6 to 9 times a year
Des Moines, Ia.	Y. M. C. A.	54,000	60′	20′	8′	4′	204–455	164	78	3 times a week
Des Moines, Ia.	East D. M. H. S.	.....	40′	20′	7′ 6″	4′	25–100	....	Irreg.	2 times a week
Dubuque, Ia.	Y. M. C. A.	48,000	60′	18′	8′ 6″	3′ 6″	.....	....	.....	Irregular
Fort Dodge, Ia.	Y. M. C. A.	35,000	60′	18′	8′ 6″	3′ 6″	125–150	255	72–80	2 times a week
Iowa City, Ia.	I. C. High School	25,000	40′	20′	5′	3′ 6″	15	1,667	.....	2 times a week
Iowa City, Ia.	S. U. I. (Men)	89,100	60′	30′	8′	4′	200	445	76	3 to 4 times a year
Iowa City, Ia.	S. U. I. (Women)	61,200	60′	24′	7′ 8″	3′ 9″	225	254	84	3 to 4 times a year
Keokuk, Ia.	Y. M. C. A.	55,000	51′	23′	8′	4′	150–200	315	75–82	2 times a week
Ottumwa, Ia.	Y. M. C. A.	45,000	50′	24′	7′ 6″	4′ 6″	150	300	80	Once a week
Sioux City, Ia.	Y. M. C. A.	8,547	30′	12′	6′	3′	100	85	76	2 times a week
Waterloo, Ia.	Y. M. C. A.	40,000	40′	20′	6′ 6″	4′	150	267	70–76	2 times a month
Louisville, Ky.	Y. M. C. A.	97,000	75′	30′	8′	4′	300–400	277	76–80	1 to 2 times a week
New Orleans, La.	Elks Club	56,000	50′	25′	7′	4′	50–100	747	65	3 times a week
Lawrence, Kan.	U. of K.	50,000	50′	20′	8′	8′	100–200	333	76–78	.....
Annapolis, Md.	U. S. N. Academy	160,000	80′	60′	5′ 2″	3′ 8″	400	400	72–75	2 times a month
Cambridge, Mass.	Y. M. C. A.	45,000	60′	20′	7′ 6″	3′ 6″	150	300	72	2 times a year
Springfield, Mass.	Int. Y. M. C. A. Coll.	75,000	60′	24′	8′	4′	300	250	68–75	Once a year
Springfield, Mass.	Y. M. C. A.	.....	75′	25′	7′	3′ 6″	200	....	74	.....
Ann Arbor, Mich.	U. of M. (Women)	.....	.....	.....	5′	3′ 6″	10–40	....	70–74	Every 3 weeks
Detroit, Mich.	Y. M. C. A.	100,000	75′	30′	8′	5′	300	333	76	Every 3 weeks
Grand Rapids, Mich.	Y. M. C. A.	53,000	60′	22′	8′	3′ 6″	200	265	75–80	Every 3 months
Minneapolis, Minn.	Y. M. C. A.	30,000	35′	20′	5′ 6″	4′ 6″	250	120	72–75	2 times a week
St. Paul, Minn.	Church Club	52,000	50′	25′	8′	3′	54	963	78	6 times a year
St. Paul, Minn.	Wilder Baths	90,000	70′	30′	8′	4′	460	189	78	2 times a week
St. Paul, Minn.	Y. M. C. A.	80,000	75′	25′	8″	4′6″	175	457	72–74	2 times a week
Columbia, Mo.	U. of Mo.	40,000	50′	20′	.....	.....	.....	.....	.....	.....
Kansas City, Mo.	Y. M. C. A.	35,000	45′	20′	7′	3′ 6″	75–300	187	76–80	3 to 24 times a year
Kansas City, Mo.	Y. M. C. A.	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas City, Mo.	Y. M. C. A.	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis, Mo.	St. Louis U.	.....	100′	50′	20′	4′	100	.....	.....	2 times a week
St. Louis, Mo.	Central Y. M. C. A.	58,000	69′ 6′	22′	6′ 6″	4′	200	290	76–80	1 to 3 times a week
Omaha, Neb.	Y. M. C. A.	.....	60′	20′	8′	3′ 6″	100–125	....	78	2 to 3 times a week
Buffalo, N. Y.	Central Y. M. C. A.	54,000	60′	20′	8′	4′	200	270	74	.....
New York, N. Y.	Coll. City N. Y.	125,000	100′	28′	8′	5′	900	139	74	Once a week
New York, N. Y.	23d St. Y. M. C. A.	55,000	48′	24′	′ 6″	4′ 6″	300	183	65–70	Once a week
New York, N. Y.	W. Side Y. M. C. A.	60,000	60′	21′	8′ 6″	5′	600	100	74	2 to 3 times a year
Cincinnati, O.	Y. M. C. A. (Old)	.....	40′	18′	6′	3′	100–300	....	70–78	3 times a week
Cleveland, O.	Case S. A. S.	.....	60′	29′	8′	4′	100′	....	76–78	2 to 3 times a month
Cleveland, O.	Central Y. M. C. A.	85,000	75′	25′	8′	4′	400–500	188	76	Once a week
Columbus, O.	O. S. University	.....	40′	20′	6′	3′	400	....	76	Daily
Columbus, O.	Y. M. C. A.	50,000	58′	18′	6′ 6″	2′6″	200	250	78	3 times a week
Dayton, O.	Y. M. C. A.	.....	60′	24′	7′ 6″	4′	200	....	78	6 times a year
Toledo, O.	Y. M. C. A.	50,000	60′	20′	7′	4′	150	333	80	Once a week
Philadelphia, Pa.	Central Y. M. C. A.	96,000	75′	25′	8′ 6″	4′ 6″	300	320	76	Once a month
Pittsburgh, Pa.	E. Liby. Y. M. C. A.	60,000	60′	30′	8′ 6″	3′ 6″	250	240	76	1 to 2 times a week
Pittsburgh, Pa.	Hilltop Y. M. C. A.	.....	.....	.....	8′ 6″	3′ 6″	60	....	76	3 times a week
Pittsburgh, Pa.	Laurenceville Y.	50,000	60′	20′	7′ 6″	4′ 6″	100	500	76–78	Once a week
Charleston, S. C.	Y. M. C. A.	67,265	60′	20′	8′	4′	.....	....	79–84	Once a week
Galveston, Tex.	Y. M. C. A.	25,000	37′	20′	11′6″	4′	100	250	.....	2 times a week
Salt Lake City, Utah	Deseret Gym.	88,000	60′	30′	8′ 6″	5′ 6″	600	147	78	Once a week
Richmond, Va.	Y. M. C. A.	40,000	60′	20′	7′	4′	200	200	68	2 to 3 times a week
Spokane, Wash.	S. A. A. Club	.....	44′	20′	8′	3′	100	....	68	3 times a week
Spokane, Wash.	Y. M. C. A.	35,000	48′	18′	7′ 6″	3′	50–300	171	75	2 times a week
Appleton, Wis.	Y. M. C. A.	50,000	60′	20′	7′ 6″	3′	100	500	74	4 times a year
Menomonie, Wis.	Stout Institute	100,000	.....	.....	8′	3′	50	2,000	78	.....
Halifax, N S.	Y. M. C. A.	27,000	40′	18′	8′	4′	50–200	216	74	Once a week
Montreal, Ont.	Y. M. C. A.	80,000	75′	25′	9′	4′	350	229	70	Once a week
Ottawa, Ont.	Y. M. C. A.	30,000	40′	18′	8′	4′	250	120	68	Once a week
Quebec, Que.	Y. M. C. A.	56,000	50′	25′	8′	3′	40	1,400	70	1 to 2 times a week

NOTES—*A = alum, Cl = chlorine, CH = bleach CS = copper sulphate, U. V. = Ultra violet ray. (1) Circulation Superior. (9) Wilson gravity. (10) Kennicott-Jewell. (11) Loomis-Manning. (12) American Water Softener Co.

POOL DATA

Purification Process.								
	Filters.							
Treatment*	Capacity, 24 Hours	Size	Number	Type	Source of Water.	Cost of Water Per 1,000 Gals.	Water Examinations Made.	Trouble and Complaints
(1)					City			
CH-(1)					City			
CH-(1)					City			
A-CH-CS-(2)	144,000		1	Gravity	Stream	Free	Twice a week	Filter too small.
(3)	720,000		3	Col. Jewell	Ocean		Regular intervals	None.
Cl.					Ocean			
A-CH		60″	1	Scaife	City	Flat Rate	Weekly	Excess hypo
CH					Well			
A	37,440	40″	1	Jewell	City	10¼c.	Twice a year	Excess alum
					City			
A				Sand	City	Free		Too small—odors.
A	144,000			International	City			Sediment.
A-CH	120,000			Jewell	City		Daily in summer	Very few.
CH				Jewell	City		Monthly	Slight
A-CH			2	Scaife	City	Free	Every 2 weeks	Sediment, hypo
					City			
CH					City			
CH					City			
CS					City			
A				Jewell	City	10c.	When needed	No
CS					City			
CH					City			
CH-CS					City			
					City			
A-CS	72,000	50″	1	Pressure	City	10c.		No
CH					City			
A	14,400		1	Jewell	City	10c.		Lint, etc.
A-CH				Kennicott	City	10c.		
CS					City			
CH					City			
A-Cl-CS	116,000	60″	2	Pittsburgh Pres.	Well		Daily	Sediment and
A-Cl-CS	138,240		1	Pitts'gh Gravity	Well		Daily	Irritation from Cl.
					Well			
CH					Well			
					City			
					City			
A-CH			2		City	11–15c.	Daily for 2 weeks	When large amount of hypo
(4)				Sand	(13)			No
					City			
Cl					Well			
CS			1	(8)	Well	Private	Every 4 weeks	No
A-CH-CS (7)			3	(9)	Well	Private	Twice a month	Hypo feed and excess
A-UV				Jewell	City	⅝=3.3 c.		Excess alum
CH-(1)					City			
A-UV	132,000		1	Hygieia	City		Weekly till O. K.	Filter too small; sediment
A-CS		60″		International	City	7c.	Monthly	Very few
CH					City			
A-CS	108,000	30″	3	Norwood	City	8c.		Turbid after filling
CH				Sand	City	Free	Almost weekly	Very little
CS					Well			
(5)					City			
A-CH		50″	1	Lynn	City	8c.	4 or 6 weeks	Stoppage
A-CH		38″	1	Kennicott	City	8c.	4 or 6 weeks	Hypo feeder
A-CH		42″	1	Roberts	City	8c.		
					City			
CH					City			
					Well			
A-CH	81,000		1	(10)	City	2c.	2 or 3 times a year	Hypo tank
					City			
				Jewell	City			
A-UV				(11)	Ciry		2 or 3 times a year	Seldom
					City			
A-Cl					City			
A-CH			2	Scaife	City	40c.	2 times a month	Excess alum or hypo
					City			
CH					City			
A-UV		52″	1	Jewell	Well		Monthly	Mechanical
CH					City			
CS				(12)	City	Charity rte	Weekly	No
CH					City			
A				Scaife	City			No
Chemicals					City			
A-CH					City			
CS					City			
CH-Salt				Jewell	City	6½c.	4 times a year	
A-CH					City			
					City			
					City			
A-CH					City			
CS-(1)					Well			
CH					City			
					Well			
(6)					City			
					City			

(2) Open air. (3) Electro-chlor. (4) Aeration. (5) Antiseptics. (6) Half-filled daily. (7) Soda ash. (8) Lynn
13) Salt well.

never be allowed to run below 10 parts per million. If an excess of alum is used, it may afterwards precipitate in the pool, making the water turbid. Complaints of smarting of the eyes of the swimmers will also result. In some cases after-precipitation of alum has taken place, altho the alkalinity of the pool water was theoretically sufficient, probably only slightly in excess. Preliminary settling basins or tanks thru which the water could flow slowly before filtration would remove this trouble. Care is necessary in handling soda ash, in order not to use too much of it, as it tends to render the products of the reaction soluble to some extent when present in too great amount.

The purpose of the filter is to remove the turbidity and some of the color of the water. Such matters not only make the water less sightly, but they also detract from the efficiency of the sterilizing processes in use at the present time. Refiltration does not remove sufficient numbers of bacteria to allow the germicidal treatment of the pool water by some other means to be dispensed with

The filtered pool water is usually treated with the ultra-violet rays, copper sulphate or chlorine. Each has its advantages and its disadvantages.

ULTRA-VIOLET RAYS

The ultra-violet ray has been shown to be an efficient germicide when the water to be treated has had sufficiently long exposure to the rays. The water must be exposed in thin layers and must be clear in order to secure good results. Probably on account of insufficient exposure to the rays, the plants at some pools have not been as successful as desired. The advantages of the ultra-violet ray are the impossibility of over-treatment and the absence of odors and tastes as a result. The disadvantages are the rather high first cost, the expense of repumping at the lamps, the cost of the new lamps and current.

COPPER SULPHATE TREATMENT

The copper sulphate treatment has been much used. Unlike the chlorine treatment, it operates best when the chemical is continuously added to the pool in small quantities. It is quite expensive at the present time. We have found it relatively more efficient in the destruction of the organisms of the ordinary soil and water types than those which grow at the temperature of the body. However, it seems to eliminate the intestinal colon bacillus, for we seldom find this organism in 10 cubic centimeters of our pool water when using copper sulphate. It is my opinion that the organisms which grow at 37° C. are precisely the ones that should be removed, and it is chiefly on this point that I base my preference for the chlorine treatment. In our pool operation we have used from ¼ to 1 part per million of copper sulphate per day—a quantity equivalent to from 2 to 8.3 pounds per million gallons. In a hard water the copper is precipitated and then removed by the filters.

CHLORINE TREATMENT

The chlorine treatment can be applied by one of three types of reagents—calcium hypochlorite, alkaline hypochlorites or liquid chlorine. This represents the cheapest and most efficient process. To-day practically every water-works plant in this country, where the water is in any way purified, uses chlorine treatment as a final safeguard. The great objection to the use of hypochlorites in swimming pools is the heavy odor of chlorine which seems to lie on the surface of the water and the fact that the action is so soon over and the free chlorine dissipated. The swimmers may object to the chlorine if they smell the familiar bleaching powder odor. These objections are often imaginary. I have had complaints regarding chlorine when the tank was filled with fresh water and no chlorine had been used in the pool for three months. Other operators report similar experiences.

Chlorine, unlike copper sulphate, works best when added in concentrated doses. We have had the best success with it when we added the chlorine just after the pool was closed in the evening and added a much heavier dose when the pool was closed on Saturday night. In handling the calcium hypochlorite (which can be obtained at any grocery under the name "chloride of lime") a weighted bag on a string is used. The suggestion for this procedure is due to Bunker. The coarse bag is jerked along the bottom and a small amount of the powder is thrown into the water at each jerk. This method avoids the escape of the chlorinous odors into the room. We have used hypochlorite at the rate of about 15 pounds per million gallons for our ordinary treatments.

PHILIPPINE LIBRARY

A variant of this method consists in using alkaline hypochlorites. They may be made by the electrolysis of brines or sea water or by stirring bleaching powder into a considerable amount of water and then adding enough sodium carbonate to precipitate the calcium as calcium carbonate. After settling, the clear liquid is used. The only advantage that I see is the avoidance of the sludge of impurities from the calcium hypochlorite.

Liquid chlorine requires the installation of special apparatus for its administration. The chlorine itself is cheap. The apparatus occupies very little space. It provides an exact and workmanlike administration of the gas.

The essential thing in the operation of the swimming pool is the provision of a sufficient amount of purified water to rapidly dilute the contamination introduced by one's neighbors in the pool. The fresh, vigorous organisms in the pool water are more likely to cause infection than those enfeebled forms which have been able to exist for a time under the unfavorable surroundings which the pool offers. On this account the freshly purified water should enter near the surface of the water at the shallow end of the pool with sufficient force to produce a distinct current. The filters and pumps should have sufficient capacity to enable them to turn over all the water in the tank in the time the pool is open for use.

REMOVING SEDIMENT AND FLOATING MATTER

Sediments in the tank may be rather unsatisfactorily removed by the use of weighted brushes sweeping the dirt toward the outlet. A better scheme is the use of a machine built somewhat like a vacuum cleaner, which sucks up the dirt. An objection to it is that it also removes a considerable amount of pool water at the same time. Floating matters may be removed by raising the pool level and running the surface water off into the scum-gutters. Cheese cloth drags operated by men on opposite sides of the tank are also effective.

SUPERVISION OF BATHERS

All of these devices are greatly helped or hindered by the attitude of the attendants and the efficiency of their supervision of the bathers. Thoro shower baths should be taken—in the presence of the attendant if possible. The position of the attendant should be such that he may inspect the bathers as they come into the pool room. Those having skin disturbances, infections or colds should be uncompromisingly excluded. Spitting and blowing of the nose into the pool should not be tolerated. Notices directing the emptying of the bladder before going into the pool room will tend to reduce pollution by urine. Floor talks, explanations and endeavors to secure the coöperation of the swimmers will be well repaid in better hygienic conditions.

Municipal War Service Resolutions

Extracts from the Resolutions Adopted by the Executive Committee, League of Kansas Municipalities, January 17, 1918

WHEREAS, The supreme need of the time is the concentration of the energies of all individuals, organizations and units of government upon work necessary for the winning of the war; therefore

Be it resolved by the Executive Committee of the League of Kansas Municipalities

1.—That it is recommended that during the period of the war each and every city government in this state shall undertake only such paving and other improvement work as may be actually necessary to be undertaken at this time; thereby releasing men and money for the service of the National Government.

It is understood that adequate local public utility service must be maintained, and that to that end the municipal operation and ownership of any privately owned public utility may be or become a matter of vital public need and necessity.

2.—Municipalities should make themselves efficient agencies of publicity and education in matters relating to the war and war problems; and should set a good example to their citizens, as for example in the purchase of Liberty Bonds for sinking funds.

3.—Cities should place at the Nation's service such municipal property and such

time and energy of their officers and employes as may be utilized without detriment to the safety and welfare of the city.

4.—Municipalities of size should organize and train their police and fire departments for emergency riot service; should render all possible and proper aid to the home guard companies; and should cooperate loyally and efficiently with the federal authorities for the discovery and suppression of sedition, treason, incendiarism and sabotage. A vigorous and just enforcement of the law, as a preventive of crime and disorder, is a duty of the utmost importance incumbent upon the responsible city authorities.

5.—Cities should strictly observe the principles of efficiency, rational economy and the elimination of waste, thru the perfecting of their organizations, the constant study and improvement of municipal methods, and the utilization of community wastes such as garbage and paper, in such manner as may be possible and practicable under local conditions.

For any family or person within the borders of a city to suffer unjustly from want of fuel or food is a disgrace to that community and its municipal government.

We commend the initiative and efforts of the city of Lawrence in establishing an emergency municipal wood yard, supplying families of that city with wood for fuel, when coal was unobtainable, and furnishing and delivering such fuel at reasonable prices based not on the privateering principle of all that could be obtained, but upon cost; and we commend this example to the cities thruout the state.

7.—Municipalities must now put forth unusual efforts to protect the public health. Efficient local health departments should be supported loyally by cities and citizens. Inefficient health officers should be relieved of their duties, and thru a reorganization of their departments the public be better protected against disease. Increased attention to child hygiene and welfare is also undoubtedly a vital necessity; and municipalities should heartily coöperate with and support the work of the state board of health in this service.

8.—The production and conservation of food being essential to victory in the war, we recommend as touching our obligations and opportunities in this connection:

(a) That the cities and city officers lead wholeheartedly in the campaign for war gardens and vacant lot cultivation. Cities should throw open to cultivation all available unused land owned by them, and should either rent other vacant lots for the purpose or lend their support to obtain the donation of the use of such lands by their owners.

(b) The local authorities should aid in seeing that the ground is plowed, if necessary hiring the plowing and harrowing of lands which could not otherwise be gotten ready for cultivation.

(c) Seeds should be supplied at cost or less, and water for garden use should be supplied by the city at very low rates.

(d) Expert advice and demonstrations should be provided to aid first-gardeners in carrying out their good intentions.

(e) Municipalities should aid in the enforcement of food control orders and requests of the Federal Government. For this purpose the cities may well stretch to the limit every power they possess. In the same manner,

(f) It is the duty of the cities to see that there is no suffering of families for want of food. Municipal food kitchens may become necessary in Kansas cities as they have in the land of our ally, whose navy is one of our greatest protections. We would, however, especially recommend to city officials earnest consideration of the establishment of municipal markets; and of the purchase of needed staple articles of food, in quantities, for sale to their people.

9.—It is recommended that for the purpose of coördinating the patriotic work of individuals, societies and organizations in the various cities of Kansas, the municipalities arrange for city war committees or war councils, in which the patriotic agencies referred to may be directly or indirectly represented, and thru which their efforts may be coördinated and unified in the service of the Nation.

Resolved, That free labor employment service should be established in the cities of the state, and that we recommend that such service be established by the municipalities.

The following letter from the Secretary of the Treasury was received by Homer Talbot, Secretary, League of Kansas Municipalities.

February 11, 1918.

Dear Sir:

I have received your letter of February sixth, transmitting copy of the Municipal War Service Resolutions adopted by the Executive Committee of the League of Kansas Municipalities on January 17, 1918.

I have read these resolutions with the keenest interest and greatest satisfaction. I congratulate the League upon the patriotic and far-sighted spirit which it has evinced in passing the resolutions, which I hope may be emulated by many other municipalities or leagues like your own.

Cordially yours,

W. G. McAdoo.

Will Your City Exceed Its Quota in the New Liberty Loan?

APRIL 6th, the first anniversary of America's entrance into the European war, was selected by Secretary of the Treasury McAdoo as the most appropriate date upon which to issue the Third Liberty Loan. It will be a matter of extreme pride to know how one's native city reaches and then strikes beyond its assigned quota. It is a fact that in the last two campaigns some of the cities fell below their quotas. This was probably thru no lack of patriotism, but thru ignorance on the part of the majority of the citizens. They did not realize the tremendous importance of the Liberty Loan and what it meant to the future of the United States.

On the other hand, there was a much larger percentage of cities that exceeded their quotas. They have just cause for pride, and in the third loan it will undoubtedly be their object to still further increase their subscriptions.

The matter of rivalry between cities as to which do and which do not make good and go beyond their quotas should be rightly regarded. Such rivalry should never be the chief incentive to roll up as high a total as possible. First of all should come patriotism, a proper recognition of the fact that the country is relying on each city, and that the welfare of generations yet unborn rests upon the victory of the United States in this war. But a friendly rivalry as a lesser motive often lends zest to the campaign. Every public official, every member of a chamber of commerce or board of trade, should realize his personal responsibility.

The people must be reached. The men in the shops, the laborers, the professional men—all must have it impressed upon them that every man, woman and child is vitally concerned in the Third Liberty Loan. It is the life of their country and their cities that is at stake. The cities of France and Belgium are laid waste to-day. In order that the cities of the United States need never be even in danger of such a fate, Germany must be defeated.

Courtesy of Packard Motor Car Company

THE LIBERTY BELL IN THE LIBERTY LOAN PARADE, PHILADELPHIA

Items of Municipal Law

By A. L. H. Street

Change in Police Pension Plans

Although a provision for the payment of pensions to the families of policemen must be regarded, so far as concerns the future, as part of contemplated compensation for services, and not as a mere gratuity, yet where a pension is predicated merely upon length of service and death within that period, the pension right is destroyed by repeal of the ordinance or statute authorizing it before death occurs. But where a policeman was injured in San Francisco in 1912, in the course of his service, and when there was in force a statute providing for payment of a pension to widows of policemen killed in the line of duty, subsequent repeal of that statute before his death in 1915, as a direct result of his injury, did not divest his widow's right to a pension under the old law and bring her within the provisions of a new statute declaring that pensions should be paid in such cases only on death occuring within one year after receipt of injury. (California Supreme Court, O'Dea vs. Cook, 169 Pacific Reporter, 366.)

✣ ✣

Garage Locations—Liability of Officials

A section of the Milwaukee ordinances providing that "when two-thirds of the lots fronting on one street in any block * * * not within the business section are occupied by buildings devoted to residence purposes," no garage shall be erected on any lot in such block on such street, did not apply to a block containing twelve lots, six of which were occupied by dwellings, one by a saloon, and the remainder vacant. Hence, the building inspector was properly mandamused to issue a permit for the construction of a garage. But his mistaken interpretation of the ordinance did not subject him to personal liability for damages resulting from his original refusal to grant a permit. "It is the general rule that officials acting in honest exercise of their judgment in the discharge of such duties are not liable in damages to private persons for their mistakes and errors." (Wisconsin Supreme Court, State vs. Harper, 165 Northwestern Reporter, 281.)

Liability for Mob Action

Under the Kansas statute providing that "all incorporated cities and towns shall be liable for all damages that may accrue in consequence of the action of mobs within the corporate limits, whether such damages shall be loss of property or injury to life or limb," the Kansas Supreme Court has affirmed judgment for $8,500 in favor of plaintiff for loss of her husband's life when he was shot by a body of men led by the city marshal. It is found that the testimony supported the jury's finding that a mob was formed for the purpose of taking the man's life after he had assaulted the marshal, and not in a good faith to arrest him, as claimed on the part of the city. (Harvey vs. City of Bonner Springs, 169 Pacific Reporter, 563.)

✣ ✣

Stream as Municipal Boundary

Under an ordinance designating a boundary of a municipality as being the "south bank" of a creek, the line extends to the mean water level of the stream, and is not limited to the high-water mark. (Utah Supreme Court, Wrathall vs. Miller, 169 Pacific Reporter, 946.)

✣ ✣

Restricting Industrial Establishments

Power conferred upon cities to define nuisances does not enable them to declare that to be a nuisance which is not so in fact. For instance, it may not be declared in advance that a milk depot at which it is purposed to stable horses will be so established or maintained as to constitute a nuisance. (Illinois Supreme Court, People vs. City of Chicago, 117 Northeastern Reporter, 779.)

✣ ✣

Right to Assess Street Railroads

Legislative authority conferred on Kentucky cities of the third class to assess street railway companies for a reasonable part of the cost of oiling streets is valid, as relating to a permanent improvement of a street by making it more lasting for the purpose of travel. (Kentucky Court of Appeals, Henderson Traction Co. vs. City of Henderson 198 Southwestern Reporter, 730.)

FORWARD STEPS
REPORTED TO THE AMERICAN CITY BY MUNICIPAL OFFICIALS & DEPARTMENT HEADS

For this department the editors will welcome short articles from city, town and county officials and heads of departments, on subjects of interest and practical value to others engaged in similar work. Photographs, plans, or other illustrative material, should accompany the articles whenever available.

MAYORS

Food Direct from Producer to Consumer

ALBANY, N. Y.—It has been the policy of the city of Albany to provide a place for bona fide raisers and producers of foodstuffs to sell their products direct to the consumer without paying a tax. For many years the raisers of such products were allowed the privilege of standing on either side of the street railway tracks on State Street, a broad thorofare and the main approach to the State Capitol, between Eagle and North Pearl Streets, for a distance of about 500 feet.

As the city grew and the occupancy of State Street for such purpose produced a congestion, a movement was inaugurated for the creation of a Market Square. This culminated in the passage of an act providing for the creation of a commission of three to select a site, and authorizing the city to bond itself for an amount not exceeding the sum of $185,000 to purchase the real estate needed, to drain and pave such real estate and meet the other expenses that might be necessary in establishing a market thereon. The site selected is 235 x 270 feet, and is within an eighth of a mile of the principal retail district. It is paved with asphalt and is not covered.

The Inspector of Markets is appointed by the Mayor at an annual salary of $1,500, to be paid monthly by the City Treasurer out of the rents, fees and charges received from the market. The Inspector must give a bond to the city in the sum of $1,000. He has exclusive charge and control of the market place and the wagons, stands and stalls, and can prevent the sale or the offering for sale of improper articles—in

THE PUBLIC MARKET IN ALBANY, N. Y.

fact, the general management of the market is in his hands. He turns over to the city all moneys payable by law for the use of the stalls, the stands and standing room, and makes monthly reports to the Common Council. His daily attendance at the market from 5 A. M. until 1 P. M. is required, and he is expected to give directions respecting the arrangement or removal of any article, vehicle, box or basket in the market or the street near-by. He is also responsible for the maintenance of cleanliness in and about the market, and reports violations to the Common Council.

The stands are leased by the Market Committee of the Common Council. The map of the market, which the City Engineer was required by law to prepare, shows about 150 stands, one-third of which are leased at prices ranging from $100 to $300 a year. The remainder are free and are set apart for the sole use of farmers and market gardeners who sell country produce raised upon farms or lands owned or occupied by them. The words "farmers and market gardeners" are here used to mean only such persons as obtain a living by agricultural pursuits and not by butchering and selling meats.

Every day except Sunday is a public market day, but it is unlawful for carts and wagons to remain on the market after 1 P. M. It is illegal to buy any articles of food in the market for the purpose of selling them again in the market during market hours—that is, from the opening until 10 A. M.—and it is also forbidden to offer for sale any fresh meat in pieces or quantities less than one-quarter of the animal, or fresh fish in pieces or quantities less than 200 pounds. The sale of unwholesome foods is prohibited and is punishable for each offense by a fine of $10 or by imprisonment of not more than ten days, or by both such fine and imprisonment. Sales in carriageways and walks are prohibited, and there is a penalty for throwing out refuse or injuring the property around the market. All weights and measures are sealed by the City Sealer and must be inspected by him at least once every three months.

The creation of the market and its maintenance and management have met with the approval of the people of Albany.

JAMES R. WATT,
Mayor.

A Combination Sand Truck and Street Sprinkler

Canon City, Colo.—In the latter part of May, 1917, Canon City, a municipality of

THE CANON CITY COMBINATION TRUCK USING A DUMP BODY AND CARRYING A LOAD OF GRAVEL

about 6,000 population, purchased one 3½-ton Federal truck—a combination sand bed, with Wood hydraulic hoist attachment, and 1,000-gallon gravity water sprinkler. This truck was delivered during the latter part of July, and has been in use by the city for 119 working days from the time it was installed to March 1, 1918, with the following results:

We have delivered 952 loads of sand, each containing 3½ cubic yards of sand for street surfacing—a total of 3,332 yards. In connection with this sand truck, the city installed a Galion sand loader; two men operate the loader, one as engineer and attendant, the other employed with a team in drawing sand to be loaded. In the cost of operating the truck we include the cost of loading.

For the 119 days during which the truck has been in operation, the entire cost to the city has been $2,121.77, or a total per day of $17.83, divided as follows:

Engineer for loader	$3.00
Driver for truck	3.00
Man and team for supplying sand to loader	6.00
Oil and gasoline for loader and truck	5.03
Sand	.80
	$17.83

To have hauled 3,332 yards of sand on the street by the old method of team and wagon would have cost the city $4,998.00, or $1.50 per yard—a difference of $2,876.23 saved to the city during this period.

Using the truck as a street sprinkler, we are able to cover about eleven blocks with one tank of water. It requires three trips to cover, from curb to curb, our broadest street, which is 100 feet wide, other streets being covered by two trips, and the service obtained is fully equal to that given by six horse-drawn sprinklers of 600 gallons capacity.

The cost of repairs on this combination truck has been nominal. The truck has traveled approximately 7,140 miles, and the Firestone tires are still in very good condition. It is safe to say that within ten months' operation the truck has fully paid for itself, in the difference of upkeep and the better service given. Canon City is well pleased with its investment, and recommends to cities which find themselves in about the same condition that we were in, that the matter of initial cost should not be too seriously considered.

D. N. COOPER,
Mayor.

CITY ENGINEERS

City Departments Get Acquainted

Norwalk, Conn.—Believing that the best public service demands that public servants

TANK BODY MOUNTED ON THE CANON CITY TRUCK, FOR SPRINKLER USE

keep abreast of the times, we have adopted a policy of calling the officials in this department together bi-monthly for talks and reviews of the municipal publications, in which all take part.

At a recent meeting, Mr. Duffy, Superintendent of Roads in upper Norwalk, gave an extensive review of the current issue of The American City, and it was decided that some of the ideas there set forth might well be adopted by the Street Department of the city of Norwalk. Mr. Lewis, Superintendent of Roads in the lower part of Norwalk, was to give a report on the *Municipal Journal*, but having been called out to attend to a sewer that had become clogged, he came in late and treated his hearers to an interesting talk on how he had handled the particular emergency on which he was called. D. B. Eula, Assistant Engineer, gave a talk on the sewer system of South Norwalk, setting forth at length its peculiarities. A. S. Phillips read a well-written report on *Engineering News-Record*, and E. C. Rowley told of his experiences in enforcing the local snow ordinance.

All seemed to feel that these meetings were well worth while, both to the city and to the individual. Encouraged by the enthusiasm manifested by the men in the Street Department, we undertook to carry the idea a little farther. In most large cities, the officials of one department not only are not aware of the work of the other departments, but often do not even know the individuals at the head of them, and this has created a tendency to belittle one another. In the hope of remedying this condition, a joint meeting of the departments was held in the City Hall early this year.

Better service thru coöperation was the object advanced, and talks by the department heads on subjects connected with their respective departments and followed by round-table discussions, was the method adopted. Those present were: Mayor Jeremiah Donovan, Corporation Counsel Edward J. Quinlan, City Clerk Irving D. Robertson, Fire Chief George W. Bogardus, Police Chief William Pennington, A. E. Winchester of the municipal lighting plant, Stephen S. Hatch of the South Norwalk Water Department, F. I. Jones of the Norwalk Water Department, Assessor William Hoyt, Superintendent of Schools George Buchanan, John Milne, Superintendent of the Connecticut Light & Power Company, C. I. Finch, Building Inspector, and the Street Commissioner.

A talk was given by the Corporation Counsel, whose subject was "Accidents in Municipalities," and who said he believed the most fruitful source of accidents in cities was the highways and streets. He urged that all coöperate to prevent accidents; the police, for instance, could report a limb hanging from some tree, or some defect in paving, to the proper department, and that department could prevent an accident by remedying the matter. He said he considered the plan a good one of bringing the heads of departments together with a view to learning more about the things that arise daily that the "other fellow" doesn't know about.

Another talk was given by the Fire Chief, whose topic was "What the Public Doesn't See at a Fire." He told of the many diverse conditions that arise in the course of every fire. The Superintendent of Schools urged the formation of a "Teachers-Mothers Association" in which the teachers could coöperate with the mothers of their pupils with a view of remedying home conditions. Clarence I. Finch, Building Inspector, took the topic, "Common Violations," and declared that altho he went out looking for possible violations, he was happiest when he didn't find any. He said there was not a contractor in the city who had not made a violation at some time or other during his term of office, and while these violations were not deliberate, nevertheless each broke an ordinance. The Assessor spoke on some of the trials of his department and said that the assessors welcomed complaints because they were only too glad to correct errors. He said, also, that the assessors were only human in their fallibility, and urged that as soon as the tax lists were open, property owners should see whether their property was correctly listed.

At the close of the meeting, it was moved by Mr. Hoyt that the heads of departments meet monthly and also that they be organized. The Street Commissioner was elected Chairman and the Assessor was chosen secretary. An organization committee was appointed to meet as soon as possible and report at the next meeting, which was to be held February 28.

At this second meeting there were even more department heads in attendance than at the January meeting. Dr. William J. Tracey, Health Officer, suggested a way in which the Street Department could help the health of the city—by keeping a lookout for places that need filling in and seeing that this is done; thus a little park or a ball field may be secured and at the same time the mosquito nuisance may be lessened. Dr. Tracey also said that as the garbage dumps in the city are, for a time at least, a necessity, the ashes collected in winter could be saved and piled on the dumps to be used to cover garbage in summer time. This would help to mitigate the fly problem. Other subjects taken up were the types of roads in the city, the coal problem in its relation to the schools, the value of a Parents-Teachers Association, and the need of impressing the foreigners in the town with the importance of keeping their neighborhoods clean. Talks were given by Edward Duffy of the Street Department, Vice-Chairman Harry Rider, of the Board of Education, and Game Warden Wilbur F. Smith. At a future meeting some of the large taxpayers of the city are to give addresses.

It has been suggested that this organization be called the Civic Coöperators' League or the People's Forum. There are to be no dues. When funds are needed, a collection will be taken.

HENRY R. MINOR,
Street Commissioner and City Engineer.

Methods of Curing Concrete Pavements

Logan, Utah.—Up to the present time concrete, both plain and reinforced, is the only type of pavement that has been used in the city of Logan. These pavements are of monolithic structure 6 and 7 inches in thickness, the majority being 7 inches thick and reinforced. The reinforcing is placed 2½ inches from the pavement surface. The city has now constructed approximately 100,000 square yards of this type of pavement.

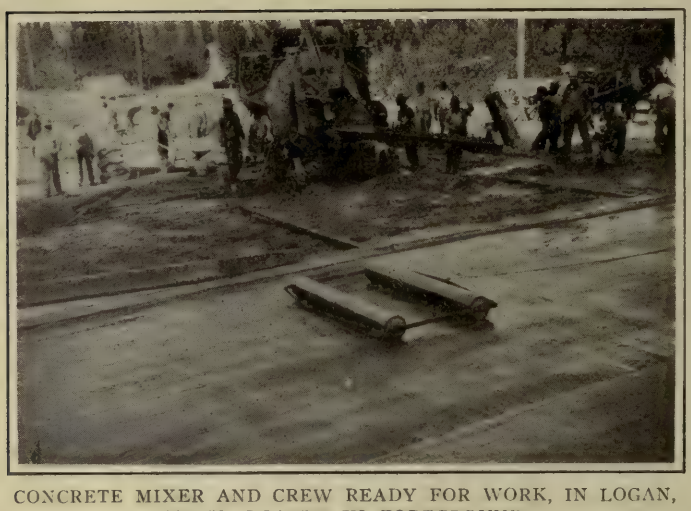
The construction practice has varied somewhat in all the jobs, but in every case the sub-grade has been wetted and thoroly compacted by rolling with a 12-ton road roller.

Approximately 1,400 feet of the sub-grade of our last job required additional preparation because, for the greater part of this length, the water stood very close to the surface. To eliminate the water we placed three lines of drains, one on each side of the street just outside the curb lines, and one down the center of the street. The drains were of No. 2 4-inch vitrified sewer pipe, laid on a uniform grade, and varying in depth from 2 feet to 5 feet below the sub-grade of the gutter, which is the lowest point of our pavement construction. The joints were left unsealed and the trench back-filled with gravel excavated from the street. The water thus collected was discharged into the sewer.

A 1:2:4 mix has been adopted and used thruout. The materials forming the fine aggregate are fine sand and screenings, while crushed lime rock gravel, graded uniformly from ¼ to 2 inches in size, makes up the coarse aggregate.

CURING CONCRETE BY POURING WATER ON PAVEMENT

On the last piece of work a 22-cubic-foot capacity street paver was used, the belt method of finishing was employed and the roller used to remove all excess water from the concrete. It might be stated, however, that the roller used was somewhat different in design from the one ordinarily used, in that it consisted of two rollers 8 inches in diameter and 6 feet long, made of 12-gauge galvanized iron metal. These rollers were secured in a steel frame made of ¼-inch band iron, and were spaced about 2 feet apart. They were operated from



CONCRETE MIXER AND CREW READY FOR WORK, IN LOGAN, UTAH; ROLLER IN FOREGROUND

either side of the pavement by means of ropes tied to the frame.

We used two methods of curing, one of which was to cover the pavement with sand or earth at least 2 inches deep, as soon as the concrete had hardened sufficiently to prevent being pitted. This covering was kept wet for at least fourteen days, or until the concrete had reached the point of final hardening.

The other method was that of ponding water on the pavement surface by means of dykes constructed longitudinally and transversely on the pavement. The lower dyke, or the one nearest the curb, was built considerably higher than the others above, —or nearer the crown of the street,—and openings were left in all the longitudinal dykes near their point of junction with the transverse dykes; openings were also left in the transverse dykes near their point of junction with the uppermost longitudinal dyke. Water was then turned into the uppermost pond of the first section. This water would run thru the openings left in the longitudinal dykes and fill the lower pond, then the central pond, then the upper pond. After filling the first section the water would pass thru the opening provided in the upper end of the transverse dyke and fill the second section, and so on. By this method about 200 lineal feet can be kept filled by the use of a garden hose attached to a residence hydrant.

As a result of the employment of these methods of finishing and curing, we secured a uniform and smooth surface on our pavement.

Several submerged wooden joints were used in the above mentioned work, and up to date the results are very satisfactory.

The oldest pavements that we have constructed are just beginning their fourth year of service, and as yet very little maintenance has been required.

A. H. CHAMBERS,
City Engineer.

HIGHWAY DEPARTMENTS

Efficiency of Department Workers Rewarded

Baltimore, Md.—The idea of rewarding the members of the Street Cleaning Depart for efficiency in their work originated in 1916, when, during the infantile paralysis epidemic, His Honor the Mayor called a meeting of the Commissioners of Health at which ways and means for combating the scourge were formulated. These men, with the other members of the department pledged themselves to coöperate with the city authorities and to report unsanitary conditions when found in the course of their work. The Mayor then suggested that a record of the efficiency of the individual members of the department be kept and that cash prizes be awarded at the end of each year for excellence.

The seven points on which awards were to be based were: (1) excellence in the cleanliness of the route or beat; (2) greatest number of properly entered reports or notice cards, of unsanitary conditions observed in the course of the daily work; (3) strict performance of duties assigned; (4) punctuality in work; (5) general neat appearance on duty; (6) daily attendance on working days; (7) good appearance of horse and cart, if the man was a driver or cartman.

In December, 1916, 70 members of the department were commended for their services and for general excellence of work, and prizes aggregating $1,045 were distributed. This last November there were 76 members who received awards totalling $1,040.

This system has been of material benefit to the department as a whole and to the city, for the general health of the city depends in a great measure on the efficiency of the street cleaning department.

WM. A. LARKINS,
Commissioner of Street Cleaning.

POLICE DEPARTMENTS

Making Street Intersections Safe at Night

Buffalo, N. Y.—The dangers of night traffic at city street intersections are well known and feared. The traffic sign, if such there be, directing drivers to "Go to the Right," may itself become a cause of accident if insufficiently lighted or lighted so as to blind anyone approaching.

The city of Buffalo has several effective installations like the one shown in the accompanying photographs. The night view shows a bright spot of light around the sign, and yet there is no visible light source in the direct line of vision of an automobilist or a pedestrian. Both the traffic sign and the street intersection are very brightly illuminated.

The other photograph is a day view of the same street intersection, and explains how the safety element is maintained at night. A flood lighting projector is mounted high on a pole set on one of the corners near the curb. This pole carries wires overhead for electric service. A standard 110-volt 200-watt flood lighting lamp, designed to burn in this peculiar position, is used in the projector, and can be adjusted so that the beam of light will fall in the desired direction. Thus the traffic order is plainly seen, and there is no excuse for its being disobeyed by a driver.

These lights have almost entirely eliminated street accidents at the corners where they are installed.

HENRY GIRVIN,
Chief of Police.

CUTTER FLOOD LIGHT PROJECTOR FOR LIGHTING TRAFFIC SIGNS, BUFFALO, N. Y.
Arrow points to projector

Photographs by courtesy of George Cutter Company, South Bend, Ind.
NIGHT VIEW, SHOWING TRAFFIC SIGN ILLUMINATED BY PROJECTOR AT TOP OF TALL POLE

PARK DEPARTMENTS

Contracts for Vacant Lot Gardening

Topeka, Kans.—During one week, recently, this department sent out 1,500 return cards, signed by the Commissioner of Parks and Public Property, and bearing the following message:

Dear Sir:

I am trying to arrange to have all vacant lots in the city of Topeka put in garden this year. This will save the owner the trouble and expense of having the weeds cut on his lots. If you will consent to have your lots in garden, I will try and arrange to get some one to garden your lots, who will agree to keep the weeds down and turn the lots over to you in the fall in as good condition as they now are.

If you are willing to do this, you can sign the attached contract and return it to me and I will have the other party sign it. If I cannot find anyone willing to do this, I will notify you.

Do not delay returning this contract signed, unless you have made other arrangements with private parties. Our aim is to produce more food to help Uncle Sam whip the Kaiser.

Very truly yours,

.....

Commissioner of Parks and Public Property.

The contract referred to, on the reply half of the card, is returnable to the Commissioner and reads as follows:

THIS AGREEMENT, made this.....day of..... 1918, by and between the owner of lots No..... .....party of the first part, and.....party of the second part.

Witnesseth: That the party of the first part, for and in consideration of the covenants and agreements of the party of the second part, hereinafter made and contained, agrees to allow the party of the second part to garden the above-described lots for the season of 1918. The party of the second part hereby covenants and agrees with the party of the first part to keep down all weeds on said lots and midway between the streets and alleys fronting and abutting on said lots, and to surrender possession of the same January 1, 1919, in as good condition as they now are.

.....

Party of the First Part.

.....

Party of the Second Part.

By this means the Commissioner becomes an agent for the owner, to act between him and the person who wants the lots.

Of course we do not get a record in this way of the total number of lots that are gardened. A great many of the cards are never returned by the owners, which goes to prove that many people owning vacant lots never think of them except at tax-paying time. When such an owner receives the card, it may be that he thinks of someone living near his lot who would use it, and so the lot is rented by the owner without his having interviewed me.

We expect to rent between 400 and 500 lots thru this office this season, and we are working on the program of "every vacant lot in Topeka in garden this year." The plan was followed in 1917, and a number of inquiries about the scheme are coming in from other cities.

W. L. PORTER,
Commissioner of Parks and Public Property.

Community Gymnasium Work for All Ages

Portland, Ore.—Community gymnasium classes conducted by the city for the benefit of men, women and children who are not members of regular gymnasiums have been inaugurated in Portland, Ore., as a part of the park and playground system. For the year of 1917, 47,000 persons were given instruction at a total cost of $3,400.

The plan is something entirely new and distinct in Portland and is likely to become an important feature of the playground work. Already applications have been received from many parts of the city not now served, for the establishment of additional classes. The classes meet thruout the fall, winter and spring.

Thru coöperation with the School Board, the use of the school gymnasiums has been obtained free of cost, and the class members use the school equipment. The only expense to the class members is for gymnasium suits. The light and the heat are furnished by the School Board, while the cost of supervision is met by the City Park Bureau.

The cost has been minimized by using gymnasium instructors heretofore employed at community houses operated by the city. Portland had one of these houses prior to January 1, 1917, and was required to keep full-time instructors. They had considerable idle time during their specified eight hours, and this has now been utilized for the community classes. At the outset the full-time instructors were able to handle all the community work, but with the rapid growth of the work, part-time instructors have been added to the force. The writer attends to all supervision, devoting what time is necessary for handling all parts of the system except instruction.

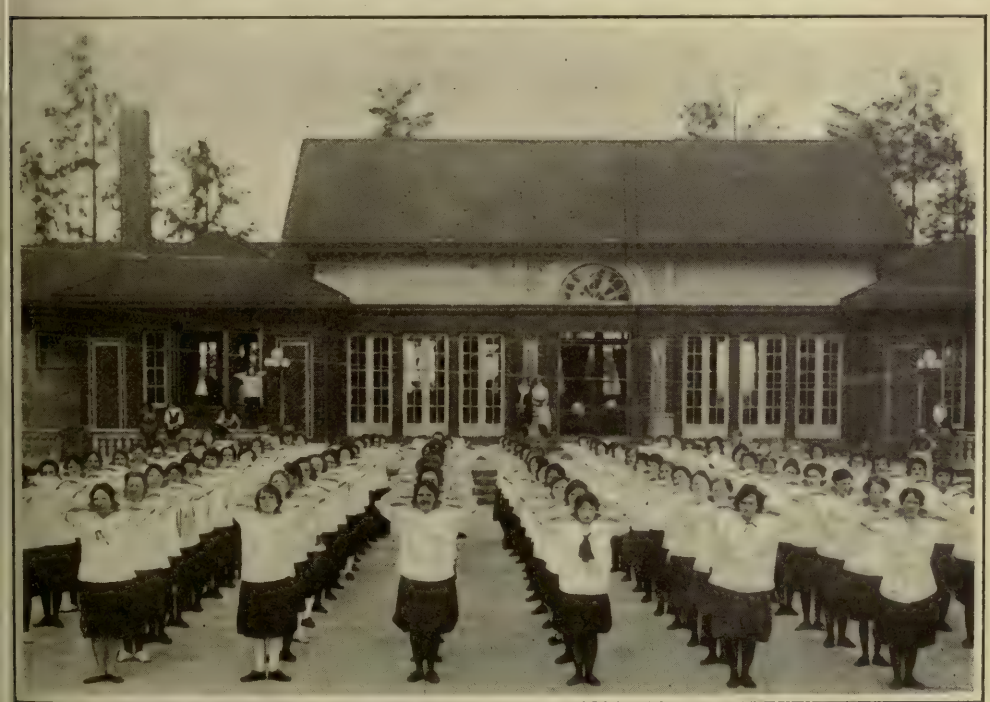
The plan so far has been to give each class one night each week. The classes range in size from 25 to 120 persons. The practice has been to make two classes out of each single class which reaches the membership of 120, because of the inability of

OUTDOOR EXERCISE AND FUN FOR THE BOYS

one instructor to properly handle more than 120 persons. In some communities the attendance has increased several hundred per cent since the opening night.

It has been found that the classes appeal to people of all ages in all walks of life. Elderly people take to the work as eagerly as the young; in some of the women's classes women as old as sixty-five years are enrolled.

The work is conducted along the usual gymnasium lines, and consists of Swedish



A CLASS OF WOMEN AT PENINSULA COMMUNITY GYMNASIUM, PORTLAND

ONE OF THE COMMUNITY GYMNASIUM CLASSES FOR SMALL CHILDREN IN PORTLAND, ORE.

exercises, folk dancing, calisthenics, apparatus work, drilling, marching, games and general athletics. The classes run usually for an hour and a half, during which time the work is diversified. Marked interest is taken, as is shown by the remarkable increase in attendance.

With the men's classes the work starts off with marching and calisthenics, after which considerable time is devoted to apparatus work.

The session is brought to a close with basket-ball, indoor baseball, relay races or games, and a short period in which the members participate in their own particular choice of exercise; one half-hour is also allowed for these special exercises before the opening of the class.

The women's classes devote more attention to formal gymnastics than to apparatus work. Their sessions start with Swedish exercises and folk dancing, and include some apparatus work, with games or races as the wind-up. The children's classes also follow the Swedish system and folk dancing largely. The policy has been to make the work more strenuous at each successive session.

The classes for men and women are all conducted at night, except one afternoon class at the Peninsula Community House for men who work at night. Children's classes are held either in the morning or the afternoon.

Up to January 1, 1917, Portland had one community house and one school in which classes were conducted for the benefit of the public. Since then the community plan has opened one more community house and sixteen more school buildings, making a total now of two community buildings and seventeen schools.

C. P. KEYSER,
Superintendent of Parks.

PUBLIC WORKS DEPARTMENTS

Suction Sweeping of City Streets

Los Angeles, Cal.—The Board of Public Works in this city has made a month's trial of the Economy suction sweeper on paved streets. With this machine, dust and refuse are picked up from the street by a brush driven at from 150 to 300 r. p. m. The refuse is taken from the brush thru the suction created by a Sturtevant slow-speed fan, and passes thru the fan into a cyclone, where the heavy dust and refuse are released and discharged into the body of the machine. The excess air escapes thru four screens which are run thru water. This tends to clean the air of all fine dust which is too light to drop into the body of the machine.

The machine is mounted on a truck with an additional 35-h.p. engine to run the fan and the brush. All the moving parts are ball-bearing; the ball-bearings are packed in hard oil and are covered with dust caps. The brush runs on two Hess Bright bearings. It sweeps a swath of 6½ feet in width, and can be raised or lowered at the option of the driver, which means that the sweeper can be used to pick up as well as to sweep continuously. It picks up all kinds of refuse, wet and dry manure, paper, glass, wire, nails, tin tobacco boxes, and other waste material. The machine is 90 inches wide, with a 144-inch wheel base, mounted on 38 x 7 pneumatic truck tires. It is operated like an automobile truck, and travels from 2 to 12 miles an hour.

The streets served by these cleaners were

swept twice a day, once each in the forenoon and the afternoon. As a rule the streets were given from two to four passes at each sweeping. Eleventh Street was given eight passes twice a day each day of the tryout, with possibly one or two exceptions. Each day a portion of some streets was given an extra pass, which was more in the nature of a passage from one street to another than sweeping service; but as this pass was swept, the area is included in the figures.

REAR VIEW OF THE SUCTION SWEEPER

Certain streets were assigned for the tryouts, the driver being permitted to use his discretion regarding the path of the cleaner in sweeping each street. An attempt was made to reach every pile of refuse on the street, the idea being more to pick up all refuse than to clean the street of dust.

There is an apparent discrepancy in the indicated miles traveled and the service miles run by the cleaner. As the service miles are the sum of the lengths of the streets multiplied by the number of passes given the street, the miles traveled, as in-

Photographs by courtesy of Motorcycle Sweeper Company, Los Angeles, Cal.

THE ECONOMY SUCTION SWEEPER ON A STREET IN LOS ANGELES

dicated by the speedometer, should exceed the service miles. With two or three exceptions, the reverse was true for every day of the test. An investigation led to the conclusion that the speedometer probably does not record the actual distance traveled. For this reason the indicated distance traveled per hour is probably less than that actually made.

The average speed maintained in such case is the average for the period, and is based on the total number of hours worked, with no deductions for the time lost on account of stops or deadheads or turns, and on the total miles reported as being the miles recorded by the speedometer. It is problematical what effect it would have on the resulting speed traveled per hour if we were able to determine the actual time consumed while sweeping, excluding all the time consumed during stops, deadheads and turns.

Prior to the tryout of these cleaners, ten hand patrol men were kept in the district, while during the tryout six gutter men only were kept in the district.

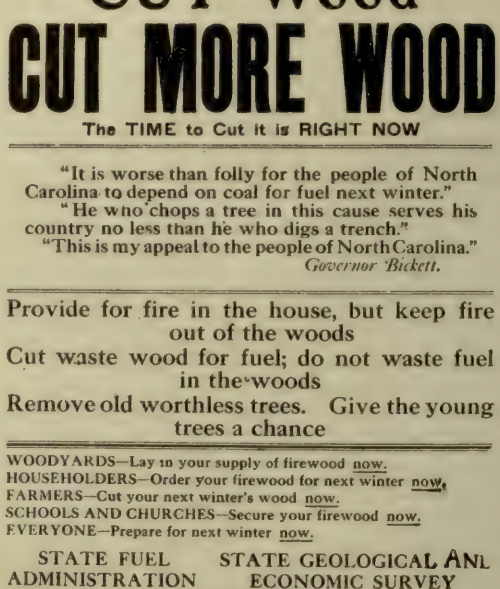
The following table gives the details of the work:

Total cost	$354.00
Total days operated (8 hours each)	29.5
Total miles traveled as indicated by speedometer	1,579.3
Total miles of street served	445.99
Total service miles run	1,573.61
Total service area cleaned (square yards)	5,850,153.
Total pick-up (cubic yards)	93.25
Average area swept per day per machine (square yards)	198,293.
Cost per 1,000 square yards swept	$0.0605
Cost per cubic yards of pick-up	$3.79
Average pick-up per unit day (8 hours' work for each machine—cubic yards)	3.19
Average area swept per one yard of pick-up (square yards)	62,736.
Average speed maintained (miles per hour)	6.69

P. P. O'BRIEN,
Commissioner of Public Works.

Prepare Fuel for Next Winter

The Forestry Division of the North Carolina Geological and Economic Survey has sent out thru J. S. Holmes, State Forester, an appeal to the local chairmen of the State Fuel Administration. At this time it is of the utmost importance that preparation be made for next winter's fuel. The matter has been impressed upon the people of North Carolina by the recent proclamation of Governor Bickett calling upon everyone to "cut wood." With the Governor's consent, the State Forester has worked up some of his ideas into the poster herewith reproduced, copies of which have been sent to the local chairmen. The request has been made that the posters be displayed at post-offices, stores, cross-roads and other public places.



The immediate establishment of municipal wood-yards in all parts of New York State is urged by Conservation Commissioner George D. Pratt, member of the Conservation Committee for New York State of the United States Fuel Administration. Rural communities are warned to make all possible use of the time before the rush of spring work on the farms to cut and prepare wood fuel. Every municipal wood yard should be under the management of a vigorous business man, and every possible cord of wood should be cut.

Civic Work of Educational Institutions

Individual Instruction vs. The Lockstep System

By Frederic Burk
President, San Francisco State Normal School

THOSE who have ever stood in a penitentiary and watched the line of prisoners marching in lockstep to their cells never forget the scene—each prisoner with hands clasping the shoulders of the man in front; the line closely packed so that it marches solidly as one man, with no power to vary the rate of gait, all individuality lost. Yet we know the individual is there—the man who fell and he who merely stumbled, the boy who a short time ago buckled on his armor to conquer the world, and he who was conquered ere he was born—all now leveled by common degradation to this ignominious equality of man. This is the lockstep—the physical lockstep of our prisons, handed down by tradition from ages when humanity did not think.

We have the mental lockstep in our schools, handed down by the same tradition from the same ages. From nine until three, every mental and physical act of every pupil, if the regulations of the class method of instruction could be carried out ideally, must be performed in unison, by external direction and dictation of the teacher. Each must work over lessons which he has already learned, because others have failed in them, and he must hasten forward with foundation lessons unlearned, because the others cannot wait longer for him. All must learn the arithmetic of shingling—little girls as well—not because all will be shinglers, but because some one might be. So also with selling stock and buying bonds, banking, surveying, horse trading, and many other vocational and avocational pursuits presented by the one course.

The unbreakable unit is the class; for if the system is to be maintained at all, no variation in the absolute uniformity can be permitted. If, by accident, one pupil makes a movement or a sound out of unison, thinks by a different route, shortens or lengthens the established time, or puts down his left foot when he should put down his right, the whole system is thrown out of gear.

Of course, it is untrue that any two children are enough alike to keep profitably in unison for five minutes, much less for a school year or for the school course. By driving, in lockstep, over the same course of study a Napoleon and a Verdi, a Francis Bacon and a Man with the Hoe, a Rembrandt and an Edison, a Byron and a Burbank, we obtain, not education, but the caricature of it.

Those who fall out of the lockstep are many. There is no means provided, nor any possible, whereby these can regain the step. A few fall behind because they are naturally slow; some stumble over a single difficulty, and before they can recover they are left behind; some are absent, and when they return they cannot catch up; many rebel and fret because there are so many waits, and become disciplinary outlaws. School statistics tell the story: 12 to 20 per cent annually fail of promotion; one-third of all the pupils in city schools have lost one, two, three or more years; over 50 per cent enter life without an elementary schooling. The full significance cannot be told. We do not know what it means to the personal problems of livelihood and to social advantages, to health and disease, to crime and citizenship, to social and civic progress, to generations unborn, that considerably over half the nation's youth go out into life without the rudiments of an education.

Individual Schooling in Operation

Some five years ago the State Normal School at San Francisco introduced an individual system into the elementary department maintained to train its students as teachers. The beginning was made very simply. No lessons were assigned, and the pupils were informed that each might do as much as he could, that the teachers would help pupils to study, and that when a pupil reached the standard of the grade in thoroness in any subject, he would be given his certificate of promotion to the next grade in that subject.

The main room is like a study hall. The pupils, each as a rule intent upon his own work, are making the best possible use of their time. Concentration is characteristic. Some are studying texts or reference material, and some may be working upon written tests of work completed. The teachers are giving help when necessary, or testing pupils who have completed a topic or section of work. If a pupil shows he has thoroly mastered the topic, he will proceed with the next; if he shows lack of clear comprehension in some features, these deficiencies will be indicated and the teacher will give him work to repair these deficiencies. Usually the repair work is different from the original and approaches the difficulty from some new angle.

The Program Plan

For each subject during the day there is allotted a certain definite period, in no case exceeding thirty minutes. During these periods all pupils, except as later stated, pursue the given subject for the allotted time, and then, upon signal, change to another subject. The exceptions—and there are many—are due to the fact that some pupils forge ahead in some subjects and fail to bring up in others. In such cases, the amount of time per day a pupil is permitted to study the advanced topic is curtailed, and this time is given to the lagging subjects. The program system is, however, giving way to the self-reliant system.

The Self-Reliant System

Pupils who have shown good judgment in the management of their school work are put on a self-reliant basis. Such pupils are permitted to pursue a subject for as long or as short a time as they, in their own discretion and judgment, may see fit. Under the program system, a pupil may be called upon to change his subject just as he has warmed up to it or is in the midst of an important solution. The "self-reliant" pupil is responsible for the adjustment of his time, so that he does not run far ahead of his grade in some subjects while he lags in others. Placed upon their own responsibility, pupils who have seemed to resist all attempts to be forced to improve their composition or writing, or who have been supposed to be "slow," have remedied their shortcomings remarkably.

Rates of Progress

Pupils vary widely in rates of progress. As a rule, in most subjects the fastest pupil accomplishes in one month what the slowest requires five months to accomplish, while the others are very evenly distributed between these extremes. Each pupil varies very much in his progress, and there are few who are continuously rapid, continuously slow or continuously medium. While the system has not been in operation long enough to have records completing the entire eight grades, the rates indicate that the variation for completing these eight elementary grades will lie between five and seven years; that is, if all pupils entered the elementary school at six years of age, they will be ready for the high school between the ages of eleven and thirteen.

Thoroness and Discipline

Individual instruction is necessarily more thoro than class instruction. Each pupil masters by himself all the work necessary to reach the grade standard as shown by thoro tests; if he is weak in any place, he is given repair exercises until he is thoro. Under an individual system, pupils vary *in the time* required to complete a unit of work, but they are practically identical in thoroness in results; under the class system the time is uniform, but they vary *in thoroness.*

The usual disciplinary problems disappear. The issue of obedience has rarely occasion to arise between teacher and pupil, and consequently the tension upon both teacher and pupil is relieved.

This new relationship between pupil and teacher is the mother of an education which has a far horizon. It means an open door

to ambition, motives and all conditions favorable to education. It means freedom to the latent birthrights of each different personality. The pupil can think in his own way and at his own rate. His teacher is not his taskmaster but his friendly helper. School is not a treadmill but an exercise-ground for his ambition, his desires and his personal ingenuity.

Introducing Individual Teaching into Rural and City Schools

To introduce an individual system of education into our public schools, we must start with the realization that, just as the class system has built special and complex machinery, so now in introducing a principle diametrically opposed, we must expect to invent and construct new and entirely different machinery. The course of study must be remodeled so that the basis of promotion shall be standards of ability or knowledge.

THE RURAL SCHOOL

The individual plan can be introduced into most rural schools with ease. Rural schools usually have an attendance of less than twenty-five pupils distributed over all grades, and the large majority of them study alone while the teacher is conducting class recitations. Pupils are not promoted out of the room except to graduate. Originally the rural schools were conducted upon an individual plan, but with the crudest conditions of teachers, texts and management. Yet the bone and sinew of America's progress have come out of them. The class recitation is superfluous folly in rural schools, for there are usually only two to half a dozen pupils in the class. By cutting out the recitation, in which the teacher wastes almost the entire day, she can give her time to supervising the study of her pupils and their progress individually, and can set apart proper times for special exercises in oral discussion.

THE CITY SCHOOL

The introduction of the individual system into cities offers greater difficulties, because practically all the city school machinery has been designed exclusively to the end of enforcing the lockstep. I would have a large study hall as the main room, or possibly two such rooms, one for primary pupils and another for older pupils. Around this study hall would be small offices in which teachers could help or test pupils individually without disturbing others. There would be smaller rooms for oral training of groups of pupils when the purpose is not to impart knowledge or to hear recitations but strictly to train pupils to talk correctly and fluently. There would also be a library, and workrooms for science, geography, construction, etc. With this physical machinery, with a course of study standardized upon the basis of proficiency and not of time-service, and with the spirit of the school established so as to use the forces of human ambition, initiative and concentration, we shall have made natural education possible.

In the schooling which constitutes the core of life-preparation common to all—the ability to read, to write and speak correctly, and to master the current numerical processes—all pupils will cover the same ground, tho each will proceed at his own rate and think by his own processes. But in the fields of native ability, such as music, drawing, literary expression, the oral arts, and also in vocational and avocational goals, the widest individuality would prevail. The administrative mechanisms for making these purposes practical and operative would certainly be new, but not difficult to establish.

Practically all teachers would be specialists. Nor will the backward pupils be a serious menace to the success of the others. Their segregation will not even be necessary. If, for reason of their expert instruction, special teachers are desirable for them, these pupils can be handled just as are special pupils in music, art or literary expression. They will be taught at their own rate of progress, by processes suitable to each, merely to the limits of their ability; and their instruction will not be affected by the instruction of others, nor will their instruction affect others.

The Question of Cost

The question upon the lips of everyone who for the first time considers the project of introducing the individual system is: "How can one teacher teach fifty pupils individually, as our class system does? More teachers, obviously, would be required; more teachers would mean more

salaries. The individual plan is too expensive."

There is an absurd fallacy contained in this question. For illustration, the schooling cost of carrying a class of fifty pupils thru one grade, if the average time is twelve months, is just double what it would be if these fifty pupils were carried thru the same grade with the same thoroness in an average of six months. We could double the number of teachers in a school *with no addition to the cost of schooling*, provided that by so doing we cut the time for schooling one-half.

If we put fifty pupils into a class under lockstep operation, all fifty will be in the same grade all of the year, and seven to ten of them will be there the following year or even longer. But under an individual plan, our data show, a few will be promoted in two months, and others continuously thereafter until, during the last two months, only a half-dozen or so will remain of the fifty. Since the pupils pass thru the school in less time, there will be in attendance at one time only a few more than one-half the total number usual under the class system. The same number of pupils receive schooling, and there would be no financial reason for reducing the number of teachers. But instead of fifty pupils per teacher, there would be only twenty-five to thirty. We should need only little more than half the number of buildings, half the interest upon the money invested in them; half the upkeep and repairs, half the janitors, half the heat, etc. In short, individual instruction, if our data upon the rates of progress are correct, will reduce the cost of our present class schooling considerably over one-half, and at the same time decrease the existing ratio of pupils per teacher nearly one-half. If after these reductions it is still found profitable to employ even more teachers in order to obtain the greatest rapidity of progress consistent with increased thoroness, there are ample means available from these savings.

It is true that in the first years of establishing an individual system we should probably find it necessary to employ more teachers in order to work off the accumulated laggardism of the class system. But we could not legitimately charge this cost as an extra expense. Schooling will never be placed upon a sound financial basis until the fallacy of the current notion that the school cost depends upon the number of pupils who may be crowded upon one teacher without regard to the time they use her services in completing a grade shall be entirely done away with.

The foregoing article is from a copyrighted pamphlet published by F. A. Owen Publishing Co.; reprinted by permission.

Lending Good Pictures to the Public Schools

By Albert Earley
Principal, North Plainfield (N. J.) High School

The North Plainfield High School believes that the schools should teach appreciation of good pictures. With this end in view, a framed copy of a good print was hung in the main corridor of the High School, where every student could see it as soon as he entered the building. A brief comment was made on the picture at the chapel exercises. After a few days the picture was taken down and a new one put up. They were changed frequently enough to keep up the interest.

The High School principal mentioned the plan to a wealthy resident of the borough, who approved of this idea and at once offered to lend any of his original oil paintings for the instruction of the students. His offer was accepted and a painting by a well-known American artist was placed in the High School. Thru the influence of the owner of the painting, the artist was induced to visit the High School and address the students. He was listened to with much interest by the students and many townspeople. We kept the first painting two weeks and then the owner allowed us to exchange it for one by another famous artist.

Other people of the borough have offered to lend us good prints and paintings. This is work which most schools can do, and it is an excellent way of more closely connecting the community and the school.

Planning the Cantonments

The Work of The American Society of Landscape Architects in Their Design

By Warren H. Manning
Landscape Designer

AT the annual meeting of the American Society of Landscape Architects, held in New York on January 8, 1918, Frederick Law Olmsted, of the Emergency Construction Committee of the Council of National Defense, and the landscape architects connected with the planning of the cantonments gave a resumé of their experiences.

Mr. Olmsted stated that his connection with this work was initiated by resolutions adopted by the National Conference on City Planning in Kansas City early in May, in which the Government was urged to adopt town planning principles in the selection of land for cantonments, also for war housing industries, and by the appointment of a committee consisting of F. L. Olmsted, George B. Ford, and E. P. Goodrich to confer with Washington officials responsible for such work.

Recognizing the need of instant action, members of the committee telegraphed from New York on their own initiative to engineers, landscape architects, and architects of the highest standing to determine whether they were ready to respond immediately, without an assurance of compensation, to a call for their assistance in the design of the cantonments. The response was very generally a favorable one.

Early Discussions, Plans and Estimates

At Washington the committees were received by Frank J. Scott, Chairman of the General Munitions Board of the Council of National Defense, and referred to the Committee on Emergency Construction, consisting of Major W. A. Starrett (Engineer Officers Reserve), an architect of New York, and two contractors, M. C. Tuttle of the Aberthaw Construction Company of Boston and C. A. Lundoff of Crowell, Lundoff, Little & Company of Cleveland. Mr. Olmsted was promptly made a member of this committee. The members of this committee were engaged to serve at a salary of $1 per year.

At just that time the Secretary of War created the Cantonment Division in the Quartermaster's Department, to take charge of the construction of cantonments, and the committee was called upon to advise in the organization of this division. At the time of its creation it consisted of Col. L. Hill, two captains, one architect, and one engineer who had been in the Quartermaster's Department for some years, and half a dozen stenographers. With the advice of the committee as to form of organization and personnel, this nucleus was very rapidly expanded. At present the force in Washington is about 450. In the conference were such men as Quartermaster General Sharp, Col. I. W. Littell, Capt. Dury, Capt. Marshall, G. B. Ford, Otis Post, John Ihlder, Asa E. Phillips, C. E., of Washington, and Geo. Gibbs, Jr. The Quartermaster's Department had made preliminary plans for one-story barracks. In conferences, however, it was determined that two-story barrack buildings would make a great saving, largely because of compactness of plan. One-story buildings were still retained for officers, storage warehouses, and the like.

During the period of organizing and planning, the ablest professional men were called in from all directions, and they worked together night and day under the greatest pressure, to develop the typical plans.

The Sites in Relation to the Standard Ground Plans

The typical U-shaped plan that was nnally adopted was very similar to the general plan first drawn up by Mr. Wheaton, the architect of the Quartermaster's Corps. This plan provided for an open space in the center, surrounded by officers' quarters at the edge of the open space. Beyond these quarters are barracks for the various branches of the service, and beyond the barracks is the Main Camp Street, along which are general buildings for enlisted men, and small storehouses. Between officers' and men's quarters a road for light

NATIONAL ARMY CANTONMENT,

traffic is provided, and crossing between these two roads are the company streets of local interest only.

The City Planning Conference in its action recommended that the Government call in properly equipped professional men to assist in locating and selecting the sites for the cantonments. This, however, was not done, and the selection was made on the recommendation of the army officers of each department of the country. Many sites were offered thru the activities of such organized bodies as the chambers of commerce in the cities where there was energy and efficiency enough to locate and secure tentative options on a sufficient area. The sites were selected under specifications that were much changed before the camps were built, and they were selected without the assistance of men familiar with town planning and housing problems on a large scale. It seems fair to suppose that the final results would have been accomplished far more rapidly and acceptably and at less cost if such men had been available for the selection. However, many of the sites chosen were very fine.

As fast as each cantonment site was selected by the Secretary of War, before an executive organization for the work could be organized, even before funds were made available for the work, Col. Littell, on the recommendation of the Committee on Emergency Construction, called upon a board of professional men, usually consisting of a water supply and sanitary engineer and a town planner, to examine the site and prepare preliminary plans for the water-supply, sewerage and general layout of the cantonment based upon the typical plans and standards prepared in Washington, but, of course, adapted in each case to the local conditions, as every case presented a separate problem.

It is interesting to refer to some typical examples of the situations that were met by the landscape architects who .were called in for advice and who went to the sites each as a member of a preliminary planning committee. James Sturgis Pray, president of the American Society of Landscape Architects, found that the exact site at Fort Riley had not been predetermined, and he was able, with the army officers, to select the most satisfactory location in the large area there owned by the Government. C. F. Pilat, at American Lake near Tacoma, found that the adopted site within the tract of some 70,000 acres, which had been given to the Government by the county thru a bond issue of some million dollars, was impracticable on account of the time and expense required to carry a railroad line to it and for certain other reasons. The army

CAMP LEWIS, NEAR TACOMA, WASH.

officer in charge had already suggested a change to another part of the reservation, but his recommendation had not been favorably acted upon. With the added weight of Mr. Pilat's urgent appeal, a new site was selected, with admirable railroad facilities and excellent and quickly available water supply, and a topography that permitted the disposal of sewage at reasonable cost, and this site was approved. At Atlanta, Ga., the site was selected and preliminary plans were made by Charles N. Lowrie, who completed the plans. He found the site high, dry, well-wooded and irregular, but it was possible to adopt substantially the typical plan at a considerably greater cost than if the land had been level.

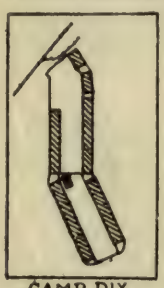
The writer, at Chillicothe, Ohio, found the selected site to be ideal in many respects. The area selected, however, had to be increased nearly three times to provide for all the buildings of the typical plan and to include an elevation adjacent thereto for the hospital site.

The preliminary planning committees were confronted in most cases with the necessity of securing a topographic survey of from one thousand to several thousand acres in a very short time. At Petersburg, where James L. Greenleaf gave advice on the preliminary plan, he found that a previous committee, of which Harlan P. Kelsey was a member, had already brought together, with the assistance of local authorities, enough engineering parties to determine the topographic conditions so that it was possible to locate the first buildings and lay down a plan for the cantonment as a whole in a very few days. Before the plans were completed, the contractors started cutting trees, but this was stopped until the lines of buildings and roads could be well enough defined to permit the necessary cutting regulations. Here the officer in charge was quite ready to save all the natural beauty that could be preserved.

The writer found that at Chillicothe there were no surveys at all, excepting a few road locations and principal boundary lines. It was necessary here to bring together all available assistance and to secure the coöperation of the county highway engineer, G. L. Perry, and his assistants. We were able in three days to make a 5-foot contour map of some 1,500 acres, including all buildings, roads, watercourses and vegetation, and to make the plan in another day and present it at Washington. There it was accepted and extended to include additional elevated land near at hand for the hospital survey, which had to be completed so that plans could be adapted to this addition.

CAMP CUSTER

CAMP DEVENS


CAMP DIX

CAMP DODGE

CAMP FUNSTON

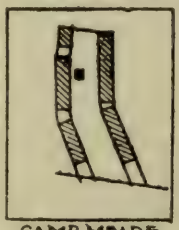
CAMP GORDON

CAMP GRANT

CAMP JACKSON

CAMP LEE

CAMP LEWIS

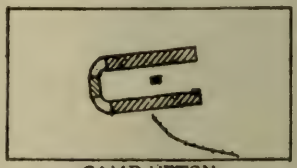

CAMP MEADE

CAMP PIKE

CAMP SHERMAN

CAMP TAYLOR

CAMP TRAVIS


CAMP UPTON
(APPROXIMATELY TYPICAL LAYOUT)

BLOCK LAYOUT PLANS
OF THE
NATIONAL ARMY
CANTONMENTS

Courtesy of The Architectural Record

The plan for Ayer that was designed by the committee of which Herbert J. Kellaway was a member was adapted to an exceedingly irregular site, requiring rather heavy cuts and fills for roads and the location of buildings on rather steep hillsides. This, however, produced an unusually picturesque massing of structures, one above another. Here a topographical survey was made of 1,600 acres in ten days by George H. Wetherbee and assistants. In clearing, all good trees were ordered preserved where possible, and this order was confirmed by the headquarters authorities. At Camp Dix, New Jersey, and at Camp Meade, Maryland, the sites were so nearly level that it was practicable to hold very closely to the typical plan.

The Construction and Equipment of the Barracks

Another one of the problems that had to be acted upon quickly by the Committee on Emergency Construction was the selection of contractors who could command the capital, the facilities, the experience and the administrative efficiency necessary for the construction of the cantonments within the time limit. The work was done on a cost plus a percentage basis, this percentage being on a sliding scale depending upon the size of the work and the estimated cost. There was an upset limit of $250,000 on the contractor's fee, and this limit was reached in all sixteen cantonments, the basis of cost being in effect on the basis of cost plus a fixed fee. The fee covering contractor's overhead expenses, interest on disbursements and profits averaged 2.98 per cent.

As the development of the work and the plans progressed, it was found necessary to make additions to buildings and changes in their arrangement. For example, the size of companies was increased from 150 to 250 men, after the barracks had been designed for 200, and the requirements as to beds and air space was changed. This made it necessary to rearrange the interior of adjacent barracks so that a company could be divided between two buildings. Considering the speed with which all the work of designing and construction has been done, it seems surprising that comparatively few changes were found necessary from the original plans when about September 15 a complete readjustment of personnel in all camps was decided upon.

The equipment of these barracks will offer an unusual opportunity to secure data on the comparative value of various types of construction and appliances. In the matter of heating, for example, the cantonment at Ayer is depending upon seven or eight central plants, each one supplying a group of buildings thru steam mains above ground. At Camp Dix, New Jersey, I visited my son when the thermometer was 14 degrees below zero, and the dormitories were comfortable. They were heated by big furnaces open at the top and placed directly on the floor, with sheet iron pipes passing directly thru the rooms and floors to the roof. As to the conditions at Ayer, a steam heating expert states that such a system is likely to be expensive for first installation and in operation and for repairs as compared with the more direct methods at Camp Dix, and notwithstanding that his interests are all identified with steam heating, his inclination would have been toward recommending the hot air furnaces. It is just such comparisons as this that we should have data upon.

It has been pointed out that one of the problems yet to be solved with the assistance of landscape men is the extreme bareness of most of the cantonments. Some form of planting plans should be devised that will give effective immediate results at low cost. Such a plan would probably be carried out with the aid of the officers and the recruits and with money that might be partly secured from available construction funds and subscriptions from the homes of the recruits.

In addition to the men heretofore mentioned, Robert Wheelwright, Charles W. Leavitt, and Richard Schermerhorn of New York City, Thomas Sears of Providence, R. I., and George Kessler of St. Louis, Mo., were identified with the planning of cantonments.

A WAR GARDEN for EVERY HOME!

In this terrible war, our brave boys in Europe and our gallant allies must have ample supplies of food. America is the great source on which everyone relies. Greater production in this country is a vital necessity. You can contribute to victory by growing vegetables.

Raise Vegetables This Year!

Let this be the slogan for 1918. No matter how small your back yard—raise vegetables! If there is a vacant lot near you—raise vegetables!! If you are a large land owner—raise vegetables!!! Whatever else you do—raise vegetables!!!! Every boy or girl or man or woman who cultivates a war garden is serving in the trenches at home.

How Does Vegetable Growing Help?

It increases the food surplus for export to Europe. It saves money that you would otherwise spend for vegetables for Thrift Stamps and Liberty Bonds. It helps lower the high cost of living for everybody. It sets free for war work the labor that would otherwise be occupied producing vegetables for you. Aren't these worth-while contributions to victory?

Start Your Garden Today!

Information on Gardening---the preparation of the soil, seed selection, planting, cultivating, etc., may be obtained, free, by writing to:

U. S. Department of Agriculture, Washington, D. C.
State Department of Agriculture, Austin.
A. & M. College, College Station.
Texas Industrial Congress, Dallas.
University of Texas, Austin.

Texas Food and Feed Production Campaign—1918

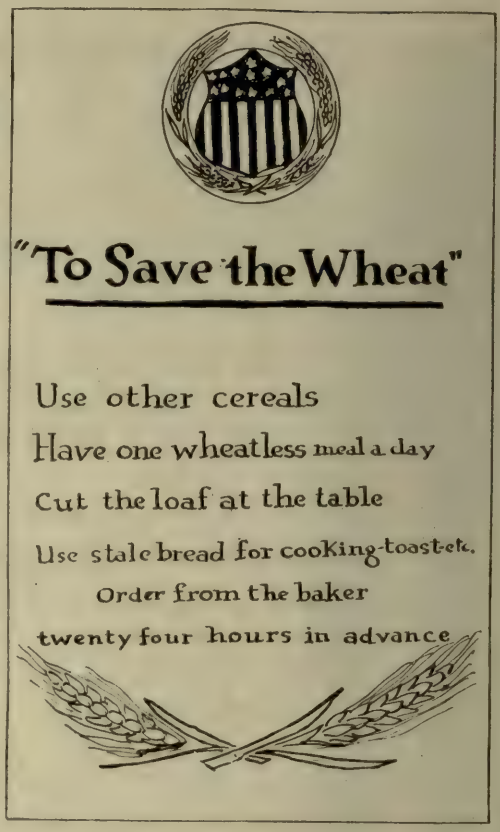
Conducted by the Co-ordinated Organizations of Texas

POSTER DISTRIBUTED BY THE TEXAS FOOD AND FEED PRODUCTION CAMPAIGN—1918

Graphic Exhibits on Food Conservation

The United States Food Administration has issued a pamphlet on the above subject which shows how to aid the Government by planning exhibits, demonstrations and contests on food conservation, to be held at the great number of fairs and expositions which take place yearly thruout the country. The subjects of immediate importance are: Save the Wheat; Economy in Use of Fats; Canning, Drying, etc.; Better Use of Milk. Detailed instructions on preparing material on the first two of these subjects are given in the pamphlet, and two appropriate poster sketches are herewith reproduced.

The state college of agriculture, thru its extension division, is the natural first source of information as to exhibits, demonstrations and contests for cities, towns, and neighborhoods. The Federal Food Administrator is the first source of information as to publications and all matters in which the U. S. Food Administration is concerned. Locally, in all counties where there is a county agent of the state college of agriculture or of the U. S. Department of Agriculture, this agent will be a source of information and coöperation. The first step may be taken by a local chamber of commerce or other interested group. In many cases the management of the local fair will be the first to act.



It is expected that the demonstrations, food exhibits, and such features as the bread-making contest and "Emergency Bread" lunch counter, will come under the direct management of the college of agriculture or the county agent. Doubtless thru the coöperation of the interested organizations much volunteer aid in the preparation of state and county fair exhibits will be available.

"The Great American Bonfire"—Who Is Responsible for It?

IN January, 1918, the final analysis of the vast accumulation of fire loss statistics for 1916 was completed by The National Board of Fire Underwriters.

It must be admitted that 1916 was not a good year: the per capita fire loss for the United States was about $2.10, as against $1.71 for 1915. This difference of 39 cents per capita means an aggregate of more than $40,000,000 increase during the year—a good deal of money when it measures an increase in unnecessary destruction.

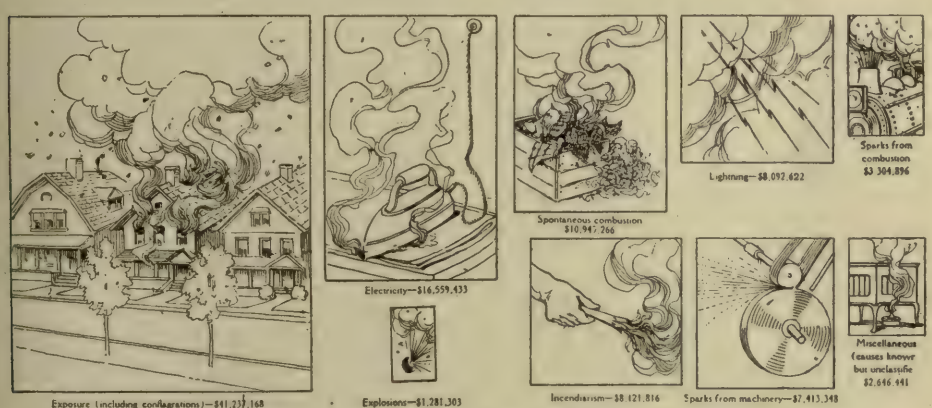
How unnecessary this destruction is appears from a consideration of the fire causes, which have been classified, roughly, into three groups: "Strictly Preventable," "Partly Preventable," and "Unknown" (probably largely preventable). The first two classes are summarized and graphically characterized in the drawings reproduced on this page. The "Strictly Preventable" list totals $60,466,054, or 28.9 per cent of the whole, every dollar of which could have been, and should have been, saved. The National Board states that "with all due allowance for innocence of intention, such fires come close to being a crime against society." President Wilson has said:

"Preventable fire is more than a private misfortune. It is a public dereliction. At a time like this, of emergency and manifest necessity for the conservation of national resources, it is more than ever a matter of deep and pressing consequence that every means should be taken to prevent this evil."

The time will surely come when such fires will be recognized as calling for punishment.

The Causes

In studying the causes of preventable fires, it is somewhat difficult to apportion the degree of preventability. For example,



STRICTLY PREVENTABLE FIRE CAUSES—$60,466,054

PARTLY PREVENTABLE FIRE CAUSES—$99,606,293

there is no known way of preventing lightning itself, but the loss therefrom may be very largely reduced by such simple means as rodding buildings and grounding metal fences. The item of "Exposure," amounting to $41,237,168, is affected by the famous "Black Tom" disaster and the conflagrations of Paris, Tex., and Augusta, Ga., and others. In each case the element of preventability was so large as almost to justify the classifying of such losses as "Strictly Preventable."

The fires of "Unknown" causes would of course have been divided among the other two groups, had not the fires burned up their own evidence of origin. From any viewpoint, it is a conservative statement to say that these were largely preventable.

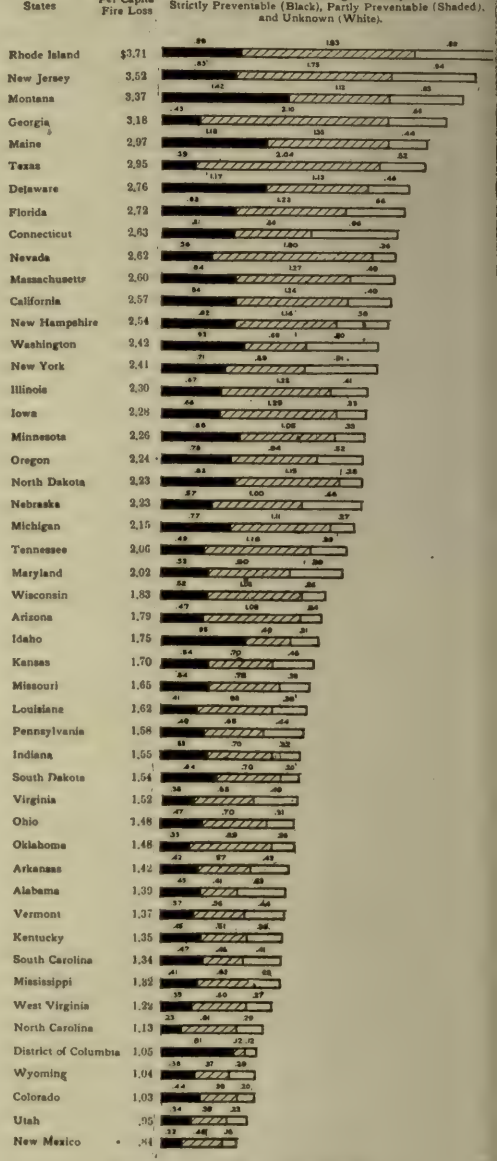
There is a total of $208,705,340 of fire losses reported to the Actuarial Bureau of The National Board of Fire Underwriters, which is believed to be between 97 and 98 per cent of the total fire loss of the country for that period, and it would be difficult to assign any portion of it as "Strictly Unpreventable."

The Losses by States

The accompanying table giving state per capita fire losses shows a wide variation in the proportion of fire losses and an even greater variation in the comparative relation of the different groups of causes. Thus, the District of Columbia, with a total per capita fire loss of only $1.05, makes one of the best apparent showings in the table, until one notes that 81 cents of its total is to be classed as "Strictly Preventable." The latter figure is almost exactly the same as that of New Jersey, whose total per capita fire loss of $3.52 was, however, next to the largest of any state. The black sections in this table are to be considered as unqualified demerits, the "Partly Preventable" sections as condemnatory, and the white portions as far from innocent.

The Shingle Roof Hazard

The shingle roof hazard is a large factor in every conflagration and is especially marked in the southeastern section of the United States. For example, not long ago a representative of The National Board spent a day in the fire headquarters of a southern city of 35,000 people and took account of the nature of the alarms which came in



FIRE LOSSES BY STATES

while he was present. Out of a total of sixteen, one proved to be a false alarm, but the other fifteen were for genuine fires, fourteen of which were shingle roof fires. In that section the use of low-grade shingles is extensive. Such shingles swiftly deteriorate when exposed to the weather, and give a ready lodging place to sparks, which fact, in view of the large use of wood for fuel, makes the danger excessive in many of the southern states.

The average loss per fire is $583.56,

altho the losses in the separate states vary from an average of $311.40 in Colorado, to $1,543.44 in Georgia.

American Carelessness as a World Danger

A study of the economics of fire destruction leads more and more inevitably to the conclusion that American carelessness is the chief fire cause. There never has been a year when this fact was so condemnatory as at present. Engaged in the mightiest struggle of all history, when national efficiency is called upon to an unprecedented degree, the folly of maintaining our traditional rate of unnecessary fire destruction becomes almost tragic. Not to speak of the several thousand fatalities which are usually caused by fire each year, there is a very real sense in which our fire losses, if continued in 1918, may lead indirectly to thousands of other deaths. A great army of our own young men is preparing to enter the battle line in France, the huge forces of our allies are becoming more and more dependent upon our resources, and the very populations of European countries are threatened with starvation unless we can send them food.

American fires destroy our supplies, imperil our resources, and weaken our energies to an appalling degree, while back of American fire losses always stands the greatest contributing factor—American carelessness. The subject, then, is no longer one of mere economics—it concerns the future of humanity itself.

Every American must cease to think of the war as an occurrence three thousand miles away. He must realize that it includes his country, his community, his place of business, and his home. Failure to recognize this fact can no longer be ascribed to ignorance. Failure to apply a prompt corrective to his oldtime habits of indifference to fire hazard, to his congenital, ingrained American carelessness, will discredit his claim longer to be considered a patriotic citizen of America.

On the Calendar of Conventions

April 10-12.—Chicago, Ill.
Chamber of Commerce of the United States of America. Annual meeting. General Secretary, Elliot H. Goodwin, Riggs Building, Washington, D. C.

April 10-13.—Philadelphia, Pa.
American Physical Education Association. Annual convention. Secretary, Dr. J. H. McCurdy, 93 Westford Avenue, Springfield, Mass.

April 11-12.—Philadelphia, Pa.
International Association of Recreation Superintendents. A convention. Secretary, Joseph J. McCaffrey, City Hall, Providence, R. I.

April 15-17.—Little Rock, Ark.
United States Good Roads Association. Annual convention. Secretary, J. A. Rountree, Birmingham, Ala.

April 23-26.—Tulsa, Okla.
Southwestern Water Works Association. Annual convention. Secretary, E. L. Fulkerson, Waco, Tex.

April 24-26.—Philadelphia, Pa.
American Institute of Architects. Annual convention. Executive Secretary, E. C. Kemper, The Octagon, Washington, D. C.

April 26-27.—Philadelphia, Pa.
American Academy of Political and Social Science. Annual meeting. Secretary, J. P. Lichtenberger, Logan Hall, West Philadelphia, Pa.

April 26-27.—Toledo, Ohio.
Ohio Commercial Secretaries' Association. Annual convention. Secretary, E. Jay Howenstine, Chamber of Commerce, Elyria, Ohio.

April 28-May 8.—Hot Springs, Ark.
General Federation of Women's Clubs. Biennial convention. Corresponding Secretary, Mrs. Francis D. Everett, Highland Park, Ill.

May 2.—New York City.
Chamber of Commerce of the State of New York. Annual Meeting. Secretary, Charles T. Gwynne, 65 Liberty Street, New York City.

May 6-8.—Cleveland, Ohio.
National Organization for Public Health Nursing. Annual convention. Secretary, Miss Maud Reeder, 571 West Fourth Street, Dubuque, Iowa.

May 7-9.—Chicago, Ill.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 87 Milk Street, Boston, Mass.

May 7-10.—Hamilton, Ont.
Canadian Good Roads Association. Annual Canadian Good Roads Congress. Secretary, George A. McNamee, 909 New Birks Building, Montreal, Quebec.

May 13-17.—St. Louis, Mo.
American Water Works Association. Annual convention. Secretary, J. M. Diven, 47 State Street, Troy, N. Y.

May 15-22.—Kansas City, Mo.
National Conference of Social Work. General Secretary, William T. Cross, 315 Plymouth Court, Chicago, Ill.

May 27-June 1.—Hamilton, Ont.
Canadian Public Health Association, to meet with the Ontario Health Officers' Association. General Secretary of the former, J. G. Fitzgerald, Toronto, Ont.

June 4-6.—Chicago, Ill.
International Association of Fire Engineers. Annual convention. Secretary, Chief James McFall, Roanoke, Va.

June 5.—Charlotte, N. C.
North Carolina Commercial Secretaries' Association. Annual meeting. Secretary, C. W. Roberts, Henderson, N. C.

June 6-8.—Boston, Mass.
National Association for the Study and Prevention of Tuberculosis. Annual meeting. Assistant Secretary, Philip P. Jacobs, 105 East Twenty-second Street, New York.

June 6-8.—Charlotte, N. C.
Southern Commercial Secretaries' Association. Annual meeting. Secretary, B. F. Johnson, Wichita Falls, Tex.

June 11-13.—Newburgh, N. Y.
Annual Conference of Mayors and Other City Officials of the State of New York. Secretary, William P. Capes, 25 Washington Avenue, Albany, N. Y.

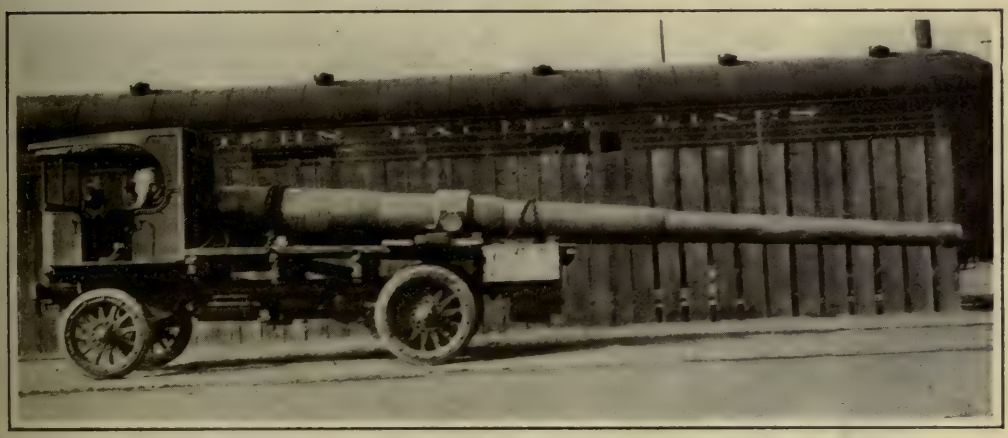
Motor Apparatus in Many Kinds of Service

The Trip of a Transplanted Tree

This pin oak, nearly 45 feet high, the spread of its top 25 feet and its trunk diameter 14 inches, was grown at the Andorra Nurseries, Chestnut Hill, Philadelphia, and prepared for transplanting by a thoro system of root pruning a year in advance. The ball of earth which protected the roots was held together by a web of chains gripping the ball on all sides. The tree was attached to a specially built platform and tightly lashed so that it stood perfectly solid. The loading, as shown in the photograph, was accomplished by block and fall, and the tree was placed on a 5-ton motor truck. The run of 45 miles from Chestnut Hill to Greenville, Del., was made in about six hours. The unloading of the unwieldy weight of ball was also accomplished by block and fall, and the tree was let down over wooden skids directly into the hole prepared for its planting.

Courtesy of American Forestry Magazine

LOAD OF NORWAY MAPLES FOR THE PARKS OF BROOKLYN, N. Y., READY FOR A 61-MILE TRIP ON A FEDERAL TRUCK



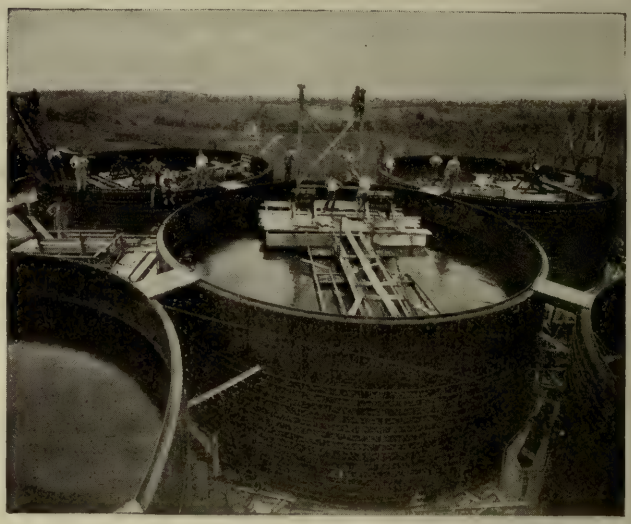
5-TON GARFORD TRUCK HAULING A 28-FOOT GUN, AS DESCRIBED IN THIS ISSUE

MOTOR APPARATUS OF ENGINE COMPANY NO. 2, HARTFORD, CONN.
Dayton Airless and U. S. Tires used

Ornamental Concrete Shells for Steel Water Tanks

THE city of Cincinnati, having received complaints and opposition from real estate holders regarding the appearance of the city's large steel water stand-pipes, has recently taken steps to improve the architectural conditions, and ornamental concrete structures have been erected around the stand-pipes.

The accompanying illustration shows the Eastern Hills tanks almost completed. The design of the finished top of the structure presents the appearance of the battlements of an old fort. There are five tanks in the group on Eastern Hills, and their relative positions will be seen from the illustration.



EASTERN HILLS STEEL WATER TANKS, CINCINNATI, SHOWING RELATIVE POSITION

ORNAMENTAL CONCRETE SHELLS FOR THE EASTERN HILLS TANKS

Method of Erecting Forms

After the steel cylinders had been erected, they were filled with water so that they would have the same shape as when in actual service. It was feared that if concrete was poured while they were empty, slight changes in shape might take place when the water was let in, and this would cause cracking of the concrete shell.

The forms for the first section setting were supported on the foundation and braced to the ground. Forms for subsequent settings were raised from floats, which can be seen in the illustration. A lifting derrick will be seen at the extreme right of one of the illustrations. The derrick is mounted on a two-boom, crab-operated rig resting on empty oil barrels on

Phillips University Library

the water surface of each of the four corner tanks. Since each panel weighs about a ton, it is practically impossible to pick this weight from a floating platform of reasonable cost which would fit in a 40-foot circle. Flotation is therefore used only when rotating the rig from one form to the next. In order to support the load, the rear end of each float is blocked down from the Z-bar which forms the top of each tank, and the forward end is held by hooks over this Z-bar.

No Interruption in Concreting

The foundation plan was about 100 feet on the side, and from 270 to 300 yards of concrete is required for a complete lift, this to be distributed over a considerable area. It was therefore possible, by using stop planks, to concrete one-half of the structure while the horizontal reinforcing was being set and while the forms were being raised on the other half; thus the mixing plant was kept going at the rate of 100 yards or more a day. The total volume of concrete placed, exclusive of footings, was about 3,800 yards.

The hoisting tower is double, one side being used for the concrete skip and the other having an elevator for the workmen. The tower also has a boom for raising the reinforcing.

The tanks were designed and built under the direction of J. A. Hiller, General Superintendent of the Cincinnati Water-Works. T. J. Mulloy is resident engineer in charge. The Ferro Concrete Construction Company, of which W. P. Anderson is president, are the contractors. J. Hodges is in charge of the work for the contractors, while the forms and methods of construction were designed by Henry D. Loring, engineer for this form.

"Thrift" in Water-Works Installations

By R. C. McWane

THE highest efficiency of our nation in the prosecution of the war for democracy cannot be maintained by the sacrifice of the communal health and property, in failure to supply our cities and towns with an abundance of water for domestic and fire protection purposes.

If this fact is faced fairly and squarely thus early in the struggle, much of the war's aftermath of suffering and hardship may be avoided. One of the inevitable results of war is a lowering of the value of human life, but this sentiment should be confined as far as possible to the field of battle, and every effort made to combat it in the homes and communities untouched by the actual ravages of the present world catastrophe.

The work of municipal water supply and sanitation must therefore go on, but with due regard to the war's influence in a tendency toward thrift. Upon a proper interpretation of the word "thrift," however, will depend much of the future financial welfare of communities planning water-works installations or extensions during the coming few years.

Take, for example, the matter of pipe, which is the largest single item of material entering into water-works construction.

For more than 250 years the type of pipe originated by French engineers, under the reign of Louis XIV, to conduct water to the world-famous fountains of Versailles, has, with certain modifications as to length of section and method of making the joints, been the recognized standard construction for underground conduits. This pipe is of cast iron, a material which, under normal soil and service conditions, is considered to be well-nigh everlasting. This conclusion is based on frequent inspection of pipe that has been in service for two and a half centuries and shows no evidence of deterioration, and on the further fact that there is no recorded instance of cast iron pipe ever having been discarded in a water supply system and replaced by any other kind of pipe.

Since the advent of the war and the marked increase in the cost of pipe, there may have come to some officials of municipalities, whose funds do not seem sufficient to meet the demands of standard cast

iron pipe construction, the temptation to "economize" by using one of the several substitutes for cast iron pipe now being offered at lower prices.

In many cases where such substitutes are offered it is clearly understood by the buyer, and frequently admitted by the seller, that the service life of the pipe is questionable. It therefore becomes a matter of "taking a chance," and if the pipe is intended for temporary use and paid for in full at the time of purchase, there might be some justification for the gamble.

But the purchase of pipe by municipalities is generally made from the proceeds of a bond issue, and in the case of most small towns such issues are in amounts very close to the limit of bonded indebtedness. It is therefore of the utmost importance to such towns that their water supply system should have a life at least as long as the twenty-to-thirty-year term of the bonds issued to cover it, but no substitute for cast iron pipe has yet been found with even this record of dependable service.

A Case in Point

In this connection, the experience of the writer's native town, a Virginia mountain hamlet of about 2,500 population, with a small pumping water system, may point a lesson.

Some years ago the need arose for a purer and more abundant water supply, which it was determined could be had by gravity pressure. Our city fathers were sincere in their desire to save the town as much money as possible in bringing the water down from the mountain; and altho the town had cast iron pipe, which had served satisfactorily for years as distributing mains in the pumping system, it was decided to use for the new 8-mile gravity supply line a substitute which could be installed for several thousand dollars less than cast iron. The undertaking was no small one for a town of that size, and a heavy bond issue was voted for the contract.

For the first three or four years after completion everything was lovely—an abundance of cold, pure mountain water at no cost except an occasional patrol of the pipe line and adjustment of air valves on the high points of the line. Then suddenly it was discovered that the supply of water was diminishing, and a close inspection by the patrol disclosed some leaks in the low places of the line where the pressures were heaviest. Repairs were made, and for a few months things went along as usual. Then the trouble broke out at a new spot. This happened with such increasing frequency that, within a year or two after the first leaks developed, the town faced the alternative of entirely replacing the line or abandoning it and going back to the old pumping system.

The debt limit had been practically reached in financing the new supply system, and the tax rate was now abnormally high. To finance an entire new contract for a supply pipe line was impossible, and to take up again the big expense of the pumping system, with the added burden of interest and sinking fund on the gravity supply bond issue, was also out of the question.

The only possible solution of the problem was for the town to buy each year as much new pipe as could be paid for from current income. This involved the strictest economy and at times real sacrifices in all other departments—streets, schools, lighting, etc. The quantity of pipe bought from year to year varied from several thousand feet to a mile or more and was used in those places in the line where the pressure was heaviest and the leakage consequently greatest. It is needless to say that the new pipe was all of cast iron, and when the writer visited the town, about four years ago, the last section of a few thousand feet had just been replaced.

Driving along one of the beautiful mountain roads just outside the town, with an old boyhood friend, now one of the town councilmen, we passed a clearing in which was piled a great heap of discarded pipe, with not a penny of salvage value. Pointing to it he said: "There is part of a 'dead horse' our town won't get thru paying for for fifteen years yet, but, thank God, we've got a live one in its place now that *is* paid for."

The experience of this town has, with certain modifications, been duplicated by scores of others in the last twenty years, of many of which the writer has personal knowledge. If these things have happened in times of peace and prosperity, how very essential it is to guard against their happening in times of war and the financial burdens that war entails.

In a recent article in *The New York*

Times Magazine on "Conscripting the Economic Man," by Henry W. Farnam, Professor of Economics, Yale University, the writer makes the following pertinent statement:

"In conscripting the economic man, we must teach him discrimination until it becomes as much a habit with him to distinguish between perishable and durable goods * * * as it is for him to insure his buildings against a fire which may never come."

The Rotary Ballot in Use in Calgary

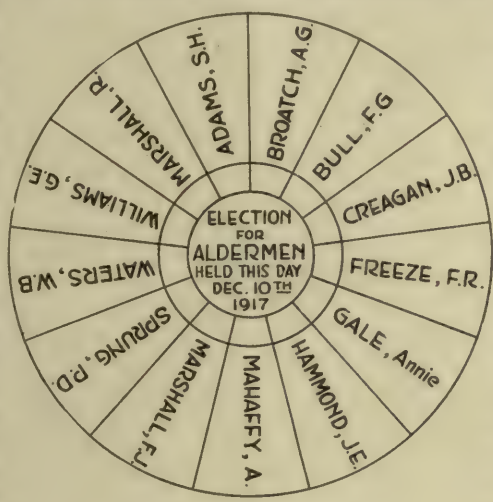
A Method of Avoiding Unintentional Discrimination Against Certain Candidates

By George E. Williams

THE city of Calgary, Alberta, has adopted a novel form of ballot to be used at the municipal elections, which, for want of a better name, might be called the rotary ballot. The old form of ballot, on which the names of the candidates were arranged in alphabetical order, led to unintentional discrimination against the man who happened to have a name beginning with a letter well down in the alphabet. If he were well known or had many friends, such discrimination might not be manifest, but if he were a new man it always told against him.

At the last election in Calgary, when proportional representation was used for the first time, this was particularly felt. It was hard to get the people to understand fully that instead of helping to elect six or eight alderman as previously, they were only helping to elect one man. Except in the case of the labor candidate, Alderman Broatch, who headed the poll, the different classes were not distinctly out to elect any one candidate. The result was that the first candidate that seemed to suit received the first choice, and they had the idea that so long as they placed a candidate in one of the first six places it did not matter; so that a man who was not particular which one of, say, four of the candidates received his first choice, naturally gave it to the man whose name appeared first on the list.

Vote by placing the figure 1 in the space opposite the name of the candidate for which you vote. You may also place the figure 2 or the figures 2 and 3, or 2, 3 and 4, and so on, in the spaces opposite the names of the other candidates in the order of your preference.



CALGARY'S ROTARY BALLOT

One of the defeated candidates, whose name begins with "W," asked for a change, suggesting the Australian method, by which each name appears in turn at the head of the ballot. It was thought this would entail extra expense, and so Alderman Broatch suggested the round robin form which he had been accustomed to use in presenting petitions to the bosses. This idea was adopted and in future the ballot will take the form of a wagon wheel, with the names of the candidates printed between the spokes. The numbers will be marked at the hub, and thus the returning officer can at a glance pick them out without having, as in the case of the old form, to run his eye up and down the paper for each number.

The names will be arranged indiscriminately, and the instructions will be printed at the top, but they might equally well be printed around the tire of the wheel.

Modern Lighting Methods

THE OLD WAY

Two sets of poles.

Tubular steel for supporting trolley wires.

Cast iron standards for lighting.

DOUBLE EXPENSE

Unnecessary obstruction along the curb line.

Underground wiring absolutely necessary.

Difficulty of keeping both sets of poles in alignment.

THE ELRECO WAY

One set of Elreco combination pol

The addition of ornamental brack and base transforms the ordinary pla trolley pole into a handsome lighti standard.

"White Way" is obtained at less th one-half the cost of a separate install tion.

Lighting wires may be attached top of poles—saving all expensi underground construction.

Curb line free from all unnecessa obstruction.

Get full details and catalog

Electric Railway Equipment Co.

Manufacturers **Cincinnati, Ohio**

NEW YORK OFFICE **30 CHURCH STREET**

News and Ideas for Commercial and Civic Organizations

Ten Thousand War Gardens This Year

MADISON, WIS.—The plan of the Central War Garden Committee of the Association of Commerce, under which all garden work in Madison will be done the coming season, is to have ten thousand war gardens in the city this summer. An expert from the University of Wisconsin has been engaged to devote his entire time to supervising the work, which will be divided into three classes, viz., the children's group gardens, the children's home gardens, and the adults' gardens.

The third group will be subdivided into two classes,—the industrial and the individual gardens. The industrial gardens will be those cultivated by the employes of industrial plants, and the individual gardens will be those cultivated by any of the citizens as individuals, either on their own property or on that procured thru the Central Committee.

The Girls' Civic League of the Association of Commerce is canvassing the city for all the land that is available for the purpose. The owners of vacant lots are expected to be sufficiently patriotic to donate the use of the ground.

The committee has made arrangements to have the plowing of the gardens done in a systematic manner. On large plots of one acre or more, tractors will be used, and teams will be employed on the smaller lots.

The problem of securing seed will be a serious one this year, and the committee is expecting to secure it from the large seed houses at special prices for combination packages suitable for the small garden plot. A car-load of seed potatoes, including both early and late varieties, will be obtained thru the Agricultural Department of the University of Wisconsin. These seed potatoes will be sold to the gardeners at cost.

Steps have also been taken toward procuring an adequate supply of plants, such as tomato, cabbage, etc., that have to be raised from the seed in greenhouses and then transplanted. The University will raise 40,000 extra plants that will be sold thru the committee at reasonable prices. One greenhouse, which last year raised 100,000 plants, has agreed to raise 300,000 this year, and another will raise 10,000 plants. This will give the committee 350,000 plants to distribute among the Madison gardeners, all of which will be sold at prices that will not be prohibitive.

One real estate firm has shown its patriotism by agreeing to pull up the inside stakes of its platted ground and donate the land for garden purposes. This is quite a concession, because the company will be compelled later to employ an engineer to replace the stakes.

The committee will insist that the person who undertakes the cultivation of a lot attend to it thruout the entire season, in order that there may be no waste of ground or seed. The committee will also insist that the weeds be kept down and that the garden be properly cared for, otherwise the supervisor will turn it over to someone else.

DON E. MOWRY,
General Secretary, Madison Association of Commerce.

Corn-Growing and Pig-Raising Clubs

MIDDLETOWN, N. Y.—If the efforts of the Middletown Chamber of Commerce are successful, there will be 300 Orange County boys and girls between the ages of ten and eighteen years growing corn and raising pigs this year. The Chamber is organizing these young people into corn and pig clubs with the coöperation of the Orange County Farm Bureau and the district school superintendents of the county. Thru the latter, all the school teachers in the county have been supplied with literature explaining the

THE HEALTH OF YOUR CITY

MUST BE SAFEGUARDED

You are not prepared for the Spring clean-up unless your equipment includes

THE OTTERSON AUTO-EDUCTOR

TO CLEAN YOUR CATCH BASINS

THE OTTERSON AUTO-EDUCTOR CO.

817 Fairbanks Bldg., Springfield, Ohio

plan, and copies of entry blanks for both clubs.

Seed corn that has been tested by the Orange County Farm Bureau will be supplied at cost to all those entering the corn club. Each member of a corn club agrees to plant and care for one-half acre of corn without assistance from any one, altho the cultivation of smaller-size plots will also be encouraged. The members of the pig club agree to buy and care for at least one pig. The members of both clubs agree to render a report at the end of the season, so that the actual results of the work can be shown. The young people may join both clubs if they wish.

The following is the wording of the entry blank for the pig club:

I desire to participate in the Orange County Boys' and Girls' Corn and Pig Club and wish to join the PIG CLUB. I will buy and care for at least one pig. I will render a report at the end of the season, so that the actual results of my work can be shown.

As a parent, I hereby consent to have
Name.....
join the PIG CLUB.
Parent's name.....

For boy or girl to fill out—
Name.....
ADDRESS.....
AGE.....
School Grade.....
School District.....
Teacher.....

Sign and return this slip to the Middletown Chamber of Commerce, Middletown, N. Y.

The corn club blank reads the same except that the following is substituted for the first paragraph in the pig club blank:

"I desire to participate in the Orange County Boys' and Girls' Corn and Pig Club, and wish to join the CORN CLUB. I will, without assistance from anyone, plant and care for one-half acre of seed corn."

Certain of the Middletown banks have consented to lend sufficient money in return for notes to the boys and girls who are otherwise unable to purchase the seed or the pig. At the end of the season, when the corn has been harvested and the pigs have been fattened and sold, the notes, with interest, will be paid to the bank.

The County Farm Bureau supplies the Chamber of Commerce with a list of the names and addresses of the farmers who have young pigs to sell, with their prices, which enables the Chamber to furnish information to those who cannot conveniently obtain it themselves.

Prizes will be awarded by the Middletown Chamber of Commerce for the best one-half acres of corn, based on both quantity and quality, and for the best showing in raising pigs.

G. D. THELEEN,
Commissioner, Middletown Chamber of Commerce.

Census of County Agricultural Resources

Elmira, N. Y.—The Chemung County Farm Bureau recently conducted a very thoro inventory of the agricultural resources of the county, under the direction of the New York State Food Commission. Such a census was taken last year, and the information secured was of so much value to the farmers that the Commission decided to compile a similar report this year and to have the work done earlier in order that it might be of even greater use. The information covered the following subjects:

1. Farm Workers.
2. Hired Help.
3. Seed Wanted and For Sale.
4. Live Stock Wanted and For Sale.
5. Fertilizers.
6. Tractors, Milking Machines.
7. Live Stock on Hand.
8. Farm Products Produced.
9. Stock and Products For Sale.
10. Land and Its Uses.
11. Farm Land.

The work was done by the school children, guided by their teachers and the school superintendents. The schedules and instructions were mailed to the teachers, who were held responsible for the work in their respective districts. Each teacher made a summary of the reports returned in her district, and all the summaries, with the blanks attached, were then taken to the office of the Chemung County Farm Bureau, which is located at Elmira, where a summary for the entire county was compiled. This was forwarded to Dr. G. F. Warren of Cornell University, at Ithaca, who was held responsible for the final report, which was to include all the agricultural counties in the state. New York is said to have been the first state to undertake such a census by counties last year. This year the United States Department of Agriculture recommended the general adoption of the plan, and similar surveys are being conducted in thirty-five other states.

The summary of the live stock, farm machinery and the amount of acreage available for cultivation afforded a clear idea of

Tarvia

Preserves Roads
Prevents Dust

Top—Troop movement over Tarvia-treated Government Post-Road, leading from Fort Sam Houston, Texas.

Middle—Military truck-trains need Tarvia roads for efficiency

Bottom—Tarvia-built road, N. Main St., Providence, R. I.

The Roads Must Help the Railroads—

PRECIOUS shipping is waiting in the harbor because cargoes are clogged on the railroads.

Factories are laying off their labor and closing because they cannot get raw materials through the railroad embargoes.

The whole internal commerce of the East is in a snarl, and it will be so intermittently till the end of the war and after.

Parallel with every railroad run the public highways. They *are not clogged* with traffic.

But they *are clogged* with mud or with neglect in various sections of the through-routes and the great swarm of motor-trucks traverse them slowly and with difficulty.

Clear those roads, the Nation needs them!

Don't let your locality be the weak link in the chain where an impassable mile puts the whole interurban route out of commission.

Don't wait for the next county to act first; they may be waiting for you. It's no time to tolerate poor roads that might be easing the overload of the railways.

Build and treat your roads with Tarvia.

The Nation's plea to our local governments to refrain from public works that can wait till the end of the war does not apply to roads.

Roads were never so vital as right now They will help us win the war

Special Service Department

This company has a corps of trained engineers and cemhists who have given years of study to modern road problems. The advice of these men may be had for the asking by any one interested.

If you will write to the nearest office regarding road problems and conditions in your vicinity, the matter will have prompt attention.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birminghan Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria
THE BARRETT CO., LIMITED: Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney N

the agricultural power and possibilities of the section. It showed where the shortages existed and where the over-supply. For instance, there was a demand for 375 dairy cows, with only 250 for sale; 425 pigs were wanted and only 113 were for sale. On the other hand, the supply of hens was more than adequate, with 1,316 wanted and 1,642 for sale.

The following table gives a summary of the seed situation in the county, which is not as serious as it is reported to be in other sections:

	Amount Needed	Amount for Sale
Spring wheat	603	72
Beans	231	1,502
Potatoes	2,566	18,159
Corn	1,437	1,282
Oats	4,035	5,160
Barley	622	363
Buckwheat	1,433	4,834

T. W. VANN,
Manager, Chemung County Farm Bureau Association.

Farmers and Business Men Discuss Food Problem Constructively

Wilkes-Barre, Penn.—With the help of the County Farm Bureau, the Chamber of Commerce held two important conferences in Wilkes-Barre in February for the purpose of discussing agricultural conditions and to provide a program by which the food production of Luzerne County might be materially increased during the year. The accompanying photograph shows a few of the 500 farmers and business men who attended one of those conferences.

The information obtained from the farmers at these meetings has enabled the men who are promoting greater agricultural production in the county to work out an excellent program for providing the necessary farm labor and equipment. They have also been able to prepare a plan for the carrying on of intensive war garden activities in the cities of the county.

All previous efforts to bring about conferences in this section of the state between the business men and the farmers had failed, and it appears that the success of the Wilkes-Barre meetings has been noised abroad so much that several other cities in the state have made plans to hold similar meetings. The Federal Food Administrators are also very much pleased that the meetings were so successful, and have reported the results to several other communities thruout the country, in the hope that the plan may help them to solve the food problem.

PHILIP R. BEVAN,
President, Greater Wilkes-Barre Chamber of Commerce.

Charlotte's War Savings Stamp Campaign

Charlotte, Mich.—A campaign was held in Charlotte recently in an effort to sell to every man, woman and child in the city either a Thrift or a War Savings Stamp. This end was achieved in three days, after great perseverance on the part of nearly every inhabitant of the town, from the

DELEGATES TO ONE OF THE CONFERENCES HELD IN WILKES-BARRE, PENN., FOR THE PURPOSE OF SPEEDING UP FOOD PRODUCTION

PACKARD TRUCKS

Proved in service! Owning six Packard Detroit Edison buys four more.

Public-service demands are exacting. Whether provided by the municipality or by a private corporation, certain services are so essential to the city's social, industrial and business life that no failure or uncertainty can be tolerated.

The Detroit Edison Company supplies such a service. To insure it against interruptions, heavy loads must be moved by motor trucks over long distances and with speed and certainty.

Six Packard trucks now operate by Detroit Edison—the oldest sin June, 1913—have proved so reliab and economical that four addition six-ton units have been ordered f early delivery.

Packard silent, chainless trucks a solving a wide range of hauling pro lems for many cities. Let Packa Motor Car Company, Detroit, he you to analyze your municipal need *Ask the man who owns one.*

Packard

president of the Community Association down to the smallest school boy. The campaign was conducted by the Charlotte Community Association, which was asked by the State Committee on National War Savings if it were possible for it to undertake the direction of a campaign to make the city a one hundred per cent community on War Savings Stamps.

The town was divided into districts, and to each district was assigned the quota of stamp sales it would be expected to make. When the twenty-eight teams, composed of two men each, who canvassed the city, had made their final report at the end of the third day, Charlotte was recorded as the first one hundred per cent War Savings Stamp city in the nation. Much hard work had been done. Chairman Elles, President Sylvester and Secretary Galloway were in the Association office from early morning until late at night during the campaign, instructing the salesmen, aiding the weak teams, replacing members of the committee with reenforcements and doing everything in their power to reach the goal.

A new city directory was compiled for the occasion and a system of records and reports was used which made it practically impossible for anyone to be missed. At the end of each evening's work, every team recorded on no-sales report cards the names of the people to whom no sales had been made. These were slipped into self-addressed envelopes of the Community Association, dropped into the nearest letter-box, and the next morning they arrived at the office of the Community Association. A special committee with automobiles was on hand every morning at nine o'clock to follow up those no-sales reports.

On the last evening of the campaign, people thronged the street in front of the Community Association building, waiting for the signal to be flashed that Charlotte was a one hundred per cent city. It was nearly midnight before the final returns were received.

Congratulations from all parts of the country have poured in upon the men instrumental in making the campaign a success. President Wilson, thru his secretary, J. P. Tumulty, wired his congratulations and best wishes, as did Frank A. Vanderlip. There is scarcely a large city in Michigan that has not asked for information and samples of the literature used. The state committee was so well pleased that it has had certain features of the campaign reproduced in motion pictures. These pictures are to be released thruout the country to help the sale of the Thrift and War Savings Stamps. The campaign was also reproduced in pictures under the direction of the Community Association. Many scenes of local interest were taken, and on one afternoon nearly every person who lives in the little city was down-town trying to get into the pictures.

G. ROBERT GALLOWAY,
Secretary-Manager, Charlotte Community Association.

Block-By-Block Plan of Canvassing

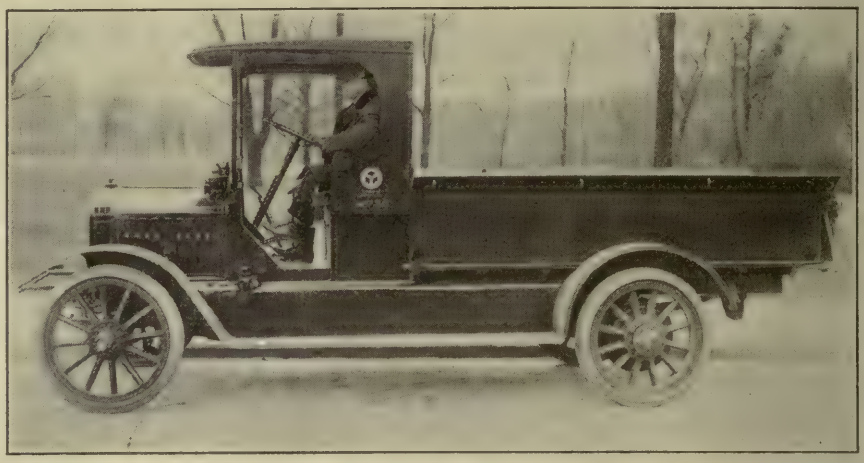
Kansas City, Kans.—The Chamber of Commerce of this city has found that the work incident to the successful conduct of war campaigns is greatly minimized by the block-by-block plan of canvassing which the Chamber is now using. The work is done by the masses instead of by a comparatively few of the busiest professional and business men, and the entire city of about 100,000 population can be canvassed in one or two days even more completely than was possible under the old system, which required from one to two weeks.

The block-by-block organization is not greatly unlike that of a well-planned political organization. The city is separated into three divisions, each division into three or four sections, each section into groups, and each group into from six to a dozen blocks. Those in charge of the divisions are called majors. The majors appoint the section captains, the captains appoint the group lieutenants, and the lieutenants name the block sergeants. To those ranking above the sergeants is assigned the work of organizing the campaign, and to the sergeants is assigned the work of canvassing each resident in the blocks of which they have charge. All the workers are supplied with badges.

The organization differs from that of a political body in that each group of blocks includes parts of at least three precincts. By disregarding precinct boundaries, the organization cannot be accused of being used for politics or by politicians.

On the day designated, each sergeant

GMC TRUCKS



For Chicago Engineering Work

When the Engineering Division of the Chicago Department of Public Works wanted a ton-and-a half truck for rough and ready service in the country's second city, a GMC was selected.

Chicago had amply tested the merits of GMC construction in trucking work of a similar nature. GMC service had been found equal in every respect to factory thoroughness in building trucks; and then there was the prestige and promise of a great and stable organization—the backing of the General Motors Corporation.

From the early times of truck building, GMC Trucks have developed with the progress of the years. GMC Trucks are made in a factory where truck building has been the sole industry. To-day there is embodied in the product every good thing known to truck making.

One of the big things in construction is GMC oversize and overstrength, imparted to every vital point in the mechanical plan of every GMC Truck. It is the GMC way.

GMC Trucks are made in six practical sizes, each better fitted than any other for a particular class of work.

Let Your Next Truck be a GMC.

GENERAL MOTORS TRUCK COMPANY

One of the Units of the General Motors Corporation

New York Philadelphia Boston PONTIAC, MICH. Chicago St. Louis San Francisco

Distributors Most Everywhere

(326)

visits every home in the block to which he is assigned. With the work in the hands of 1,600 workers, one man to each block, the canvassing requires only a few hours, and the burden is lifted from the shoulders of the few individuals who are usually responsible for the success of such undertakings. Campaigns participated in by only 200 persons require a week's time in addition to the week which it takes to organize the movement.

The Chamber of Commerce formed this organization by first sending out an appeal for volunteers to help conduct war campaigns, and then mailed return post cards to those who responded favorably, asking them to send in the names and addresses of others who they believed would be willing to give their services for such work. The organization is a permanent one, available for use during the period of the war. Now that it is organized, the workers need only to be informed what work is to be done and when. The officers of the Chamber of Commerce are confident that all the war work activities hereafter undertaken by the Chamber will be conducted more quickly and successfully by this method than ever before. The statement is justified in the light of the Chamber's experience with such campaigns in the past, even those which were conducted by the old method, which have all gone "over the top."

SAMUEL WILSON,
Manager, Kansas City (Kans.) Chamber of Commerce.

Americanization Work in Manistee

Manistee, Mich.—Manistee is a city of approximately 13,000 population, and affords a splendid field for Americanization work because of the fact that five-sixths of the population are of alien birth or parentage, one-third being of enemy alien origin. In spite of this large percentage of foreign-born population, there is a practically negligible number of aliens in the city—according to the last census, only eight-tenths per cent. The problem, therefore, was not so much to obtain the naturalization of the aliens as to create a spirit of loyalty among the foreign-born and to elevate the standard of citizenship. A committee representative of the industries, the press, the schools and the clergy was appointed, with Frank A. Mitchell, General Freight Traffic Manager of the Manistee and Northeastern Railway, as chairman.

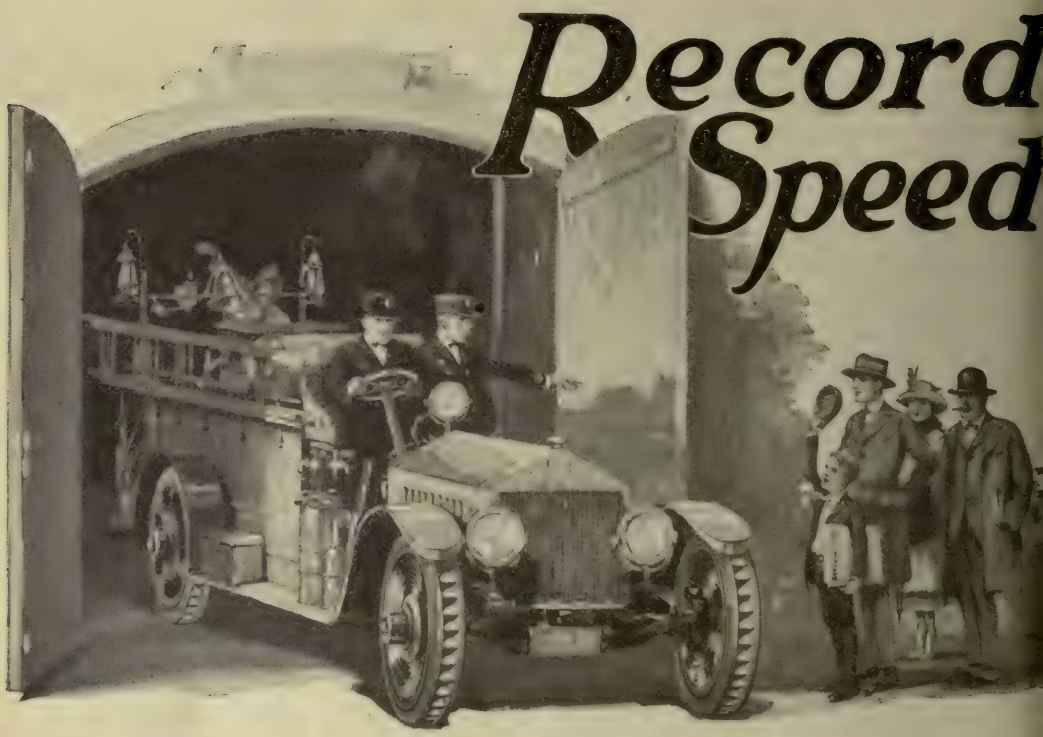
The medium decided upon by the committee for reaching the people was a community chautauqua. A series of seventy-two neighborhood meetings was arranged, to be held in the public schools, and all the available speaking, musical and other talent in the city was enlisted. Eight separate programs were prepared, each of which was presented in nine different schools. On each program a single speaker was allowed twenty minutes in which to present some phase of the general theme, "Loyalty and Citizenship." The addresses were arranged and presented in logical sequence, with a definite object in mind. For instance, the first topic was "The American Ideal," and the speakers who handled this subject recalled to their foreign-born hearers the thoughts that must have animated them when they left their homes across the water to come to the United States; the liberty, democracy, and opportunity they found here, etc. The final talk was on "How We Are Winning the War."

Community singing was made a special feature of the meetings. Booklets containing patriotic airs and a number of the old songs were obtained and distributed at each meeting. Nine men and women possessing ability as leaders of community singing were secured to take charge of this phase of the work. All of the service was voluntary. A few special nights were planned. "Orchestra Night," when the Manistee Symphony Orchestra furnished the music, was a great success.

As a climax to this series of meetings, a large general public assembly was held on the evening of Washington's Birthday at the Ramsdell Theatre. The address of the evening was delivered by R. W. Smith, President of the Manistee Board of Commerce, on the subject, "Citizenship—America for Americans." Two of his strong statements follow:

"Any man who would commit our government to a dishonorable peace rather than fight is not imbued with the proper spirit of American citizenship. The honor and glory of this war shall not pass to our soldiers alone; bravery and courage shall not be confined to the trenches and the firing line."

J. C. BEUKEMA,
Secretary, Manistee Board of Commerce.



GREAT speed with great weight. Power on the turns. These unusual strains must be resisted by tires for Fire Department Service.

Record Speed and Record Mileage can be achieved with Firestone Tires. The Pressed-On and Removable Regular and Cushion Tires are now made in sizes for fire apparatus as they have proved in heavy truck service that they stand up under just the sort of strains and wear to which they would be subjected in Fire Department Service. They permit greater speed with confidence and safety, greater mileage, more resilience.

The nearest branch office will gladly give detailed information regarding the construction and actual results obtained by the use of these tires.

FIRESTONE TIRE AND RUBBER COMPANY
AKRON, OHIO — Branches and Dealers Everywhere

Firestone

Pressed-On and Removable Regular and Cushion Tires

THE BILLBOARDS TO WHICH THE DANVILLE, ILL., CHAMBER OF COMMERCE OBJECTED

Down With the Billboards

Danville, Ill.—On the theory that reform should begin at home, the City Plan and Development Committee of the Danville Chamber of Commerce, as soon as it was organized, undertook the beautification of the plot of ground surrounding the Chamber of Commerce building. The billboards which lined the sidewalk in front of the lot hid it entirely from the view of the passer-by. The billboards were removed and the landscape gardener put to work, with the result shown in the illustration below. This action gave the city a small park in the business section where tired pedestrians may stop and rest.

P. L. WILLS,
Secretary, Danville Chamber of Commerce.

THE PARK WHICH WAS MADE POSSIBLE BY THE REMOVAL OF THE BILLBOARDS SHOWN ABOVE

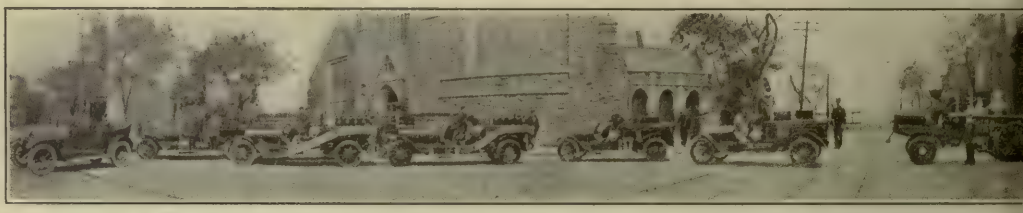
VICTORY DEMANDS EFFICIENCY FROM OUR NATION

EFFICIENCY demands UNCEASING PRODUCTION of munitions and supplies.

UNCEASING PRODUCTION demands, first of all, adequate protection against the mysterious, and seemingly methodical, fires that are threatening our plants from coast to coast.

ADEQUATE PROTECTION demands **FIRE DEPARTMENT EFFICIENCY** which depends largely upon the **RELIABILITY** and **QUALITY** of its **FIRE FIGHTING APPARATUS.**

"THE BEST IS NONE TOO GOOD"



Cohoes, N. Y., Fire Department Completely Equipped with American-La France Motor Fire Apparatus

AMERICAN-LAFRANCE FIRE ENGINE COMPANY, INC.

Elmira, New York, U. S. A.

Member of the National Automobile Chamber of Commerce. Licensed under the Dyer Patents

Branch Sales Offices and Service Stations

New York Boston Chicago San Francisco Portland, Ore. Dallas
Los Angeles Atlanta Denver Pittsburgh Baltimore Minneapolis

CANADIAN FACTORY, TORONTO, ONT.

Professional vs. Amateur Baseball

Dayton, Ohio.—Altho Dayton's government encouraged and boosted professional baseball here in 1917, that same government, indirectly but certainly, had much to do with the failure of the sport and helplessly watched the piling up of a deficit estimated at from $7,000 to $13,000, to be borne by the stockholders of the company which put the Veterans on the diamond.

Dayton's officials didn't purposely kill the sport here. Far from it. At the opening of the Central League season, Mayor G. W. Shroyer proclaimed a holiday, and, thru the newspapers, loyally urged everybody to attend the initial game and support the team thruout the season. Many officials attended as many games during the summer as their engagements would permit. The Veterans were pennant winners in 1916, and bade fair to carry off the banner again in 1917.

But Dayton's government at the same time fostered amateur baseball. Its officials felt, and still feel, that recreation is just as much a public function as are any of the other services of the city. It provided desirable recreation centers and wholesome, invigorating sports were supervised and encouraged.

So much encouragement was given amateur and semi-professional baseball that, during the season of 1917, 96 teams were organized. These teams included 1,096 players, and during the season they played 498 games before approximately 200,000 people. The entire cost of operating the division of recreation for the year was less than $15,000, and baseball was only a modest feature of the summer's activities.

Altho the managers and members of the professional club started off with high spirits, a gradually dwindling attendance disheartened the players; and instead of remaining at the top of the Central League, the Veterans nosed down to next to last place. Numerous games had been played before mere handfuls of people, and expenditures at many games were more than four times the receipts.

This was the condition of professional baseball in Dayton before the season was half over. Then came a train-wreck at Mansfield, Ill., which cost the life of one member of the team, "Deerfoot" Spencer, and disabled all the other players save one. Spencer was one of the best players on the team and had gained his nickname thru effective base-running. The team was scheduled to pay 63 games, but missed 10.

The financial transactions of the management of the Dayton team undoubtedly represented the handling of three times as much money as was expended during the year by the division of recreation, yet attendance upon the games played at Wright Park was probably not one-tenth as large as that upon amateur games. Losses to the stockholders in the Dayton team were so heavy that it was found impossible to meet the payments due upon the seats installed in the grand stand, and the seats were returned to the firm which had supplied them.

Dayton's government proposes to again encourage amateur baseball and other sports during the summer of 1918. It will spend approximately $15,000 in the work. The Dayton team has in the meantime dropped out of the Central League, and there will be no professional baseball in Dayton this year.

CLARENCE B. GREENE.

Editorial Note.—The Dayton Bureau of Municipal Research, of which Mr. Greene was a staff member, has been discontinued, the trustees having decided that the present is not an opportune time to conduct a financial campaign to carry on the work. C. E. Rightor, director of the Bureau, has accepted a position with the Federal Bureau of Efficiency at Washington, D. C.; Walter Matscheck has become director of a new civic bureau of the Kansas City (Mo.) Chamber of Commerce, and Mr. Greene has assumed charge of the publicity department of the National Cash Register Company, Dayton, Ohio.

A Full-Time Health Officer for Poughkeepsie

Poughkeepsie, N. Y.—For some time there has been discussion in Poughkeepsie regarding the advisability of requesting the city authorities to employ a full-time health officer. The city has for several years employed a physician for only half of his time.

When the Common Council prepared the budget for the 1917 tax list, no provision was made for a health officer to give his full time to the work, as had previously been arranged. Immediately upon learning this fact, the Chamber of Commerce, thru an efficient special committee, appeared before the Common Council and secured another hearing, with the result that an appropriation was finally made for a full-time officer.

Dr. Helen L. Palliser has been designated as the health officer. Those who are acquainted with her work believe that Pough-

THEY DIDN'T KNOW IT

BUT A PITOMETER SURVEY DISCOVERED THIS

And many more—all underground too, the kind that could not be seen on the surface. This city is now saving thousands of dollars in fuel alone.

Why permit water waste in your city when it can be stopped?

Write for our free literature.

The Pitometer Co., 55 Duane St., New York

keepsie will profit immeasurably by having her services. She will give her entire attention to the solution of the local health problems.

CHARLES A. SIMMONS,
Secretary, Poughkeepsie Chamber of Commerce.

Collecting Membership Dues with Applications

Parkersburg, W. Va.—To stimulate the interest of the workers in a recent campaign to collect delinquent dues and add new members to the Parkersburg Board of Commerce, credit was given for points based on the following schedule:

$25 Membership signed for one year	25	points
$25 Membership signed for two years	50	"
$25 Membership with note	50	"
$25 Membership with cash	75	"
$25 Collected on 1917 dues	125	"

The campaign was very successful; the membership was increased in two days from 406 to approximately 650 members. In order to put the organization on a cash basis, the "collect-as-you-go" method was adopted, and 95 per cent of the dues was collected at the time the applications were signed.

F. F. EUBANK,
Secretary, Parkersburg Board of Commerce.

Joliet To Be Replanned

Joliet, Ill.—At the semi-annual meeting of the Joliet Association of Commerce held in February, the Association voted unanimously in favor of replanning Joliet, and appointed a committee to secure a city planner. Fifteen hundred dollars has been provided in the city budget with which to partially defray the cost of the services of an expert city planner to survey the city and make recommendations with regard to the community's future growth. A civic center; a zoning system; parks and playgrounds; river-front improvement and canal terminal facilities; better transportation service, both steam and electric, to include a dual street transportation system providing an easy flow of traffic for both light and heavy vehicles, are some of the features which are to be incorporated in the plan.

The committee in charge will decide within a few weeks upon one of the most prominent city planners in the country to draw the plans.

E. H. KRUEGER,
Secretary, Joliet Association of Commerce.

New Bulletins

Beaver Falls, Penn.—*Official Bulletin, Beaver Falls Chamber of Commerce* is the new name of the bulletin of the Chamber of Commerce, formerly known as *Beaver Falls, Where Opportunity Calls.* The first issue under the new name appeared in March, 1918, as Vol. 2, No. 1.

Hoquiam, Wash.—*Activities,* published monthly by the Hoquiam Commercial Club.

Kingston, N. Y.—*Kingston Courier,* published monthly by the Kingston Chamber of Commerce.

Middletown, Ohio.—*The Advance,* published monthly by the Chamber of Commerce.

Minot, N. Dak.—*Business Bulletin,* the official publication of the Minot Association of Commerce.

Sacramento, Cal.—*Consolidated Effort,* published monthly by the Consolidated Chamber of Commerce of Sacramento.

Trenton, N. J.—*Greater Trenton,* the official bulletin of the Chamber of Commerce. Published monthly.

Recently Issued Printed Matter

Akron, Ohio.—The 1917-1918 Year Book of the Akron Chamber of Commerce.

Allentown, Penn.—The annual report of the Allentown Chamber of Commerce.

Ashland, Ky.—First annual report of the Ashland Chamber of Commerce.

Charleston, S. C.—A booklet containing the 1917 annual reports of the Charleston Chamber of Commerce.

Elgin, Ill.—The booklet entitled "What Elgin Needs," issued by the Elgin Commercial Club, contains a carefully worded summary of the Club's accomplishments and advantages, and makes a forceful plea for team work in the solution of community problems.

Lockport, N. Y.—A folder entitled "Work of the Second Year of the Lockport Board of Commerce."

New York City.—The Twentieth Anniversary Year Book of The People's Institute, containing many interesting illustrations.

Portland, Me.—"Definite Results, an Incomparable Record of Achievement," is the title of a folder recently issued by the Portland Chamber of Commerce.

St. Helens, Ky.—Year Book of the Commercial Club of St. Helens.

St. Louis, Mo.—"A Report of the More Important Activities of the Organization During the Year 1917," published by the St. Louis Chamber of Commerce.

Sharon, Penn.—"Invoice of a Record of Accomplishment," issued by the Sharon Chamber of Commerce.

Tonawanda, N. Y.—"Community Dividends," the first annual report of the Chamber of Commerce of the Tonawandas.

Winona, Minn.—Fifth annual report of the Association of Commerce for the period beginning April 1, 1917, and ending February 12, 1918.

Breaking Down The Transportation Question

The serious question blocking American business today is transportation.

Garford Motor Trucks are breaking through the freight congestion and assisting in bringing order and profit out of chaos for others.

Why not for you?

Your orders tied up in "No man's land" of shipping delays are losing money for you and for your customer.

Your problem is no longer one of producing, it is delivery.

Garford Motor Trucks, from one to six tons, are delivering products in the shortest possible time, at the lowest possible cost, with the least possible wastage.

They are dependable, efficient, and durable freight haulers.

Let our transportation experts help you at once.

You are doing business with a known quantity when you depend on Garford.

The Garford Motor Truck Company, Lima, Ohio

Manufacturers of Motor Trucks of 1, 1½, 2, 3½, 5 and 6 ton capacity. 4½, 7 and 10 ton Tractors
The Garford Road Builder

Distributors and Service Stations

New York, Boston, Philadelphia, Baltimore, Pittsburg, Chicago, Minneapolis, Salt Lake City, Seattle, St. Louis, Kansas City, El Paso, Canton, Portland, San Francisco, Columbus, Cincinnati, Los Angeles, Indianapolis, Harrisburg, Newark, Brooklyn, Toledo, Cleveland, Akron, Richmond, Chattanooga, Denver, Houston

PHILLIPS UNIVERSITY LIBRARY

The Increase in Postal Rates on Second Class Mail Matter

To the Editor of THE AMERICAN CITY:

THE question of increased postal rates on second class mail matter is too big to admit of special consideration for any one section of the country. The magazines and newspapers of this country are public property. The public should see to it that its property is not so taxed that it will have either to mortgage it or give it up altogether. Here we have a proposed law which will cut into two of the most vital factors of our life to-day: first, national education; second, national unity.

There has been a tremendous increase in the cost of paper, of ink, of labor. There are plenty of figures on this subject. Now let us add an increase in postage rates of from fifty to nine hundred per cent. Obviously the majority of the magazines will be seriously crippled.

Then it remains for the public to assume the cost. "Passing on" the cost to the public is a favorite slogan these days. How much of this passed-on cost of living the American public can carry becomes a problem.

Let us say that this increase will wipe out the profits of the magazines and of some of the newspapers. Let us assume that at this time of crisis, with its tragic losses, the magazines and newspapers of the country *should* lose all or much of their profits, and that it does not matter whether they do or do not go to the wall. Let us with sublime indifference to civilization—the equivalent of German brutality, altho more subtle—dismiss all consideration for the plumber, the baker, and the candlestick-maker. Let us take away from them their trade and technical journals and refuse to consider the convenience of the public they serve. Let us say that it does not matter that hundreds of thousands of men and women employed by the great network of publications should be thrown out of employment, since their labor is so sorely needed elsewhere. Let us say, on the basis of the same argument, that it does not matter that the majority of authors and journalists should lose their sources of earning a living, for war demands its sacrifices. Of course—it is so evident that it seems foolish to make this statement!—we can all move to New York. Once there we shall not have to pay twice as much for our magazines, as in California or elsewhere.

But there are two things which do matter: the first of these is that the public should lose any of its utilities in the way of public education. Now is the time when our education needs more protection rather than less.

Such action would curtail the development or entirely eliminate the better class magazines used, especially in the West and Middle East, as text-books in the English Literature courses of many of our schools and colleges. This would mean a depreciated school or classroom. Aside from school and college, many of the people who would be cut off first from the publication, because of the added expense, would be the very ones who need most the educational and perhaps the Americanizing influence of the newspapers and magazines.

Such action would mean a decrease in domestic education, the loss of magazines to millions of mothers who thru them have learned how to care for their children, how to save the lives of babies, how to make the home and the town healthful and attractive, and how to conserve food and fuel.

Such action would mean that many of the farm journals would have to go. These farm journals bring to the farmer all of the latest scientific information about the planting of crops, their care, the raising of poultry and other live stock. Now, of course, is just the right time to see that our vegetables, bushes, and trees receive a large increase in scabs and blights, and that the amount of food produced should be lessened!

The proposed action would also seriously affect the national circulation of most of the leading newspapers, which are the greatest power in this country in the construction of an adequate public opinion and in the development of a national life. Now of all times is the hour when national unity is of greatest importance to us. The Government could not go to work more efficiently to break down this national unity than by depriving the public of its newspapers and its magazines, and making it

City of Lapeer
R. F. FRAY, MAYOR

LAPEER, MICHIGAN April

South Bend Motor Car Works
South Bend, Ind.

Attention Messrs.Mecklenburg & Scott.
Gentlemen:

I am writing this letter to let you know that you we
about 24 hours early with your Munsey Committee, as last nig
Lapeer experienced the most disastrous fire ever known in he
history.

An alarm was turned in at 6.30P.M. and we put the pumpe
to work immediately, drawing from the river. She did continu
service for about 8 hours and saved the city of Lapeer at le
two valuable stores, amounting to a good many times the pric
of the entire equipment.

This morning our most radical knockers against the purc
of the machine frankly told me that the machine did not owe
city of Lapeer a cent.

It certainly did admirable and efficient service for 8
continuous work.

Very truly yours,

R. F. Fra
Mayor.

RFF/KB

—AND NOT ONLY IN LAPEER

but in every city where South Bend Double Duty Apparatus is installed. They perform that same efficient, conscientious service. They are dependable—and that's what counts in Fi Apparatus. Write us for booklets.

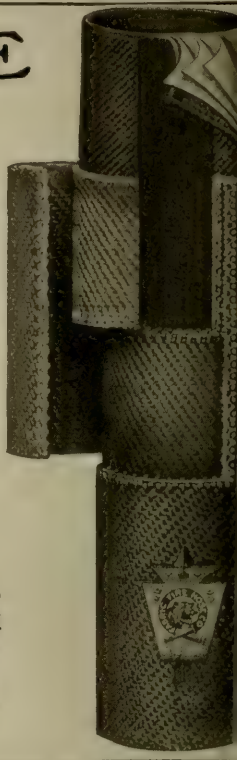
The South Bend Motor Car Works South Bend, Inc

FABRIC FIRE HOSE

is of an unusually careful manufacture

WAX and PARA GUM TREATED

The lining is of fine Para Gum, hand made, four calendered, smooth bore or lap-jointed



Circular balance woven, each strand of cotton is treated to a bath of melted Wax and Para Gum, then cabled and woven into the jackets.

Absolutely waterproof, making the ideal hose for fire departments.

Treatment lubricates and solidifies the strands of cotton, assuring long wear.

Made in all sizes from 1 to 6 inches inside diameter.

FABRIC FIRE HOSE CO.

COR. DUANE & CHURCH STS., NEW YORK

Branch Offices

CHICAGO, ATLANTA, COLUMBUS, O., MINNEAPOLIS, OKLAHOMA CITY, PORTLAND, ORE., SAN FRANCISCO, BALTIMORE, MD., ELMIRA, N. Y., BINGHAMTON, N. Y., PITTSBURGH, NEWARK, N. J., MONTREAL, PROVIDENCE, DALLAS, TEX.

Patentee and Sole Manufacturer

inevitable that public opinion should receive its future growth sectionally rather than nationally. Greatly to the advantage of the Germans, we should soon become as a house divided against itself.

Jeannette Marks
Mount Holyoke College, South Hadley, Mass.

Editorial Note.—Readers of The American City who agree with the writer of the above letter are urged to write at once to their senators and representatives at Washington advocating the repeal of the zone law for the increase of second class postal rates, which goes into effect July 1.

Standards for Housing Women Workers*

By Mrs. John D. Rockefeller, Jr.

Chairman, Housing Committee, Young Women's Christian Association

The Housing Committee of the Young Women's Christian Association deeply appreciates the opportunity the National Housing Association has given it to present some of the ideas and principles that it hopes the director of housing may find wise to incorporate in the standard which he sets for the building of houses for women war workers in this country.

1. Single rooms, because they increase the ease with which a house can be managed; also because this arrangement is more moral and sanitary.

2. A single entrance to the bedroom part of the house that can be seen from the office, where it can be watched by the matron, thereby avoiding rules which girls find irksome.

3. Adequate bathing facilities: one shower bath for every ten girls, one toilet for every six girls, one wash bowl for every ten girls, one bathtub in each wash room. It is difficult to have bathtubs kept clean; they cause friction among the girls, and they are often unsanitary.

4. A kitchen that is scientifically arranged so that labor can be saved; the kitchen and dining-room to be managed by a trained woman so that the girls may have wholesome food. They cannot be left too much to their own discretion in the choice of food.

5. Such arrangement of the rooms as to make it possible for the girls to receive their men friends in pleasant surroundings.

6. The girls must have innocent recreation. If their factory is far from town, a special recreation building should be built for them. Even when they are near or in cities, there should be a large room in the house for their social activities.

Probably the most vital question of all is what sort of women will manage such houses if they are built. The Young Women's Christian Association is sure that here is a wonderful opportunity for the finest type of woman to be of service. For the social workers and matrons there should be chosen only the ablest and wisest and the most sympathetic of women.

There are a great many other points that might be mentioned that make for the happiness of the girls, such as a laundry where they can wash and iron, a kitchenette where tea, gruel, etc., can be made, a room with a sewing machine, a small infirmary, and other useful equipment.

The Housing Committee would stand firmly for two other points: first, that the girls have some representation in the management of the house; and, second, that the board they pay should cover the running expenses of the building as well as the interest on the investment. It is felt that such houses should not be philanthropic, but, rather, coöperative.

The Committee has found from experience that the girls seem naturally to fall into the following four groups:

1. The young girls under supervision in large groups.

2. The older women in small groups without oversight.

3. Colored girls by themselves, with the same sort of house and supervision that the young white girls have.

4. Non-English-speaking foreign girls, who are better off under the leadership of an American woman, in small groups, until they learn the habits of the country and speak English.

* From a letter read at the Conference on War Housing, held by the National Housing Association in Philadelphia, February 25, 1918.

Republic Fire Hose Has Stood Hard Use

In many cities of the country, at big industrial plants and at public institutions Republic Fire Hose has proven that it stands hard usage.

Its superior wearability is now generally recognized.

The best obtainable yarns are woven by our experts into the cotton jackets.

Years of experience in building fire hose has given us the formulae used in compounding the rubber linings.

Republic Fire Engine Suction Hose is light and flexible and will withstand the most severe pumping strain

The Republic Rubber Corporation

Youngstown, Ohio

Branches in all principal cities

Municipal and Civic Publications

HUBBARD, HENRY VINCENT, Assistant Professor of Landscape Architecture, Harvard University, and
KIMBALL, THEODORA, Librarian, School of Landscape Architecture, Harvard Unisity.

An Introduction to the Study of Landscape Design. 1917. xxii + 406 + 36 plates. Photographs and drawings. **$6.00** (Postage extra.)

In this handsomely illustrated volume the joint authors have presented an essentially American conception of landscape architecture with typical insistence upon the conservation of the natural features of beauty already existing, rather than the introduction of formal, mathematically laid out pathways, gardens and terraces. The book first presents the general theory of design and then proceeds to the consideration of the more special problems, such as: Taste, Ideals, Style, Character, Effects, Composition, Natural Forms, Planting Designs, Design of Structures. The Appendix comprises "Notes on the Professional Practice of Landscape Architecture in America"; "Notes on Procedure in Design," and a "Selected List of References on Landscape Architecture." There is so little authoritative literature treating of landscape design that the present volume should be of great value and assistance to landscape architects and city planners thruout the country in connection with their work, and the uninitiated may derive from it a greater appreciation of the numerous problems involved in this new and complex subject which so closely affects our home and community existence.

ALLEN, WILLIAM H., Director, Institute for Public Service, New York City.

Universal Training for Citizenship and Public Service. 1917. x + 281 pp. Illustrated. **$1.60**

In this book Dr. Allen tells us that "the end of the war will be but a signal for new patriotism to apply what it has so painfully learned about the menace of untrained patriotism and the cost of unpreparedness for citizenship." Now is the time to formulate in so far as possible our civic ideals for the future with particular reference to the practical "next step." The essential feature of such a program is universal training for citizenship and public service so that we shall all be able to think nationally, constructively, cooperatively and with an active desire for service. The chapters of this book are as follows: The New Patriotism's Commencement Day; The Menace of Untrained Patriotism; The Cost of Unpreparedness; Universal Training for Citizenship Is Possible; Training Privates for Minimum Essentials; Training for Volunteer Civic Work; Training for Drillmasters and Teachers; Special Training for Leadership in Civic Work; Training for Entrance to Civil Service; Training for the Professions; Training for Continuance in Public and Quasi-Public Service; Specialized Training for Parenthood; Training for the Specially Gifted; and L'Avenir Est Magnifique.

WICKWARE, FRANCIS G., B. A., B. Sc., Editor.

The American Year Book. A Record of Events and Progress, 1917. 1918. xx + 822 pp. **$3.22**

The eighth issue of this important reference work follows in the main the form of its predecessors, except for the necessary changes introduced as a result of the European War. Of special interest to readers of THE AMERICAN CITY are the sections on State and County Government; Municipal Government; Public Services; Public Finance, Banking and Insurance; Social and Economic Problems; Labor and Labor Legislation; Agriculture, Horticulture, Forestry and Fisheries; Engineering; The Medical Sciences; and Education and Educational Institutions.

BENNETT, EDWARD H., Architect, and
CRAWFORD, ANDREW WRIGHT.

Plan of Minneapolis. Prepared Under the Direction of the Civic Commission. 1917. xviii + 227 pp. Colored photographs, maps, diagrams, etc. **$10.00** (Postage extra.)

A comprehensive city planning treatise has recently been issued by the Minneapolis Civic Commission. The point of view of the book is well expressed in Mr. Crawford's foreword, where he refers to the Greek conception of cities as "bodies having a consciousness and a purpose and a field of endeavor all their own." And this conception is not purely esthetic, for he continues: "Not alone, however, is this idea of planning desirable from the standpoint of beauty to achieve a 'city beautiful'—which is only a by-product—but more necessary still is such planning vital to enable the city to prepare for the utilitarian and economic uses and purposes of modern city life, to provide easy communication and easy access, to arrange for the unobstructed flow of traffic and all city activities, to provide for the health and convenience, the pleasure and recreation of the people themselves; in short, to plan all things for a well-ordered civic life, a 'city useful,' as well as a 'city beautiful.'" The chapters treat: The Coming Metropolis; The Dominating Features; The Sixth Avenue Artery; The Institute of Fine Arts; Eighth Street and Park Avenue Arteries; The Civic Plaza; The Inner Ring-Street; Gateway Park; Suburban and Intra-Urban Transportation; Housing and the Garden Suburb; Limitation of Skyscrapers; Playgrounds; River Fronts; Street Fixtures; Railroad Lines; Financial and Legal Problems.

ALVORD, JOHN W., and CHARLES B. BURDICK, Chief Engineers, Franklin County Conservancy District.

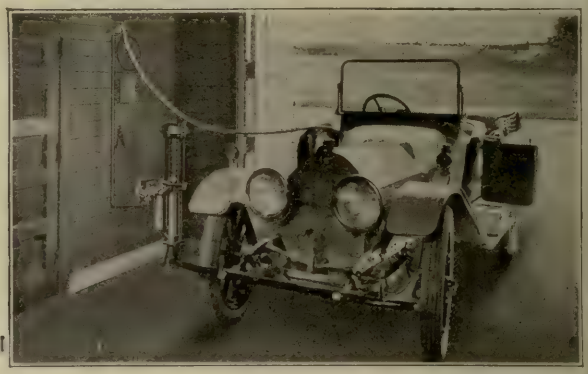
Relief from Floods: The Fundamentals of Flood Prevention, Flood Protecton and the Means for Determining Proper Remedies. 1918. viii + 175 pp. Photographs, maps, charts, statistical tables. **$2.10**

In a relatively short space this volume concentrates the essential facts and figures in regard to floods and their prevention, and the story is told in a direct and interesting manner. The book does not aim to give a minute technical exposition of the subject; the aim is rather to furnish a brief outline of the general flood problem in its many phases, showing the remedies to be applied and pointing out the way to the selection of proper works. The text deals mainly with the great floods of Ohio, on account of the special knowledge of the authors of conditions in that state, and many interesting photographs illustrate the devastating effects of floods in Dayton and Columbus. The chapter heads are: The Flood Problem; Various Means for Relief; Flood Investigations; Fundamental data; Future Floods; Flood Protection by Channel Improvement; Flood Prevention by Water Storage. The book is concluded with an interesting table entitled "Greatest Floods and Flood Ratios on Streams of the United States Having Records of 10 Years or More, Including All Records Published Up to the Year 1916."

FARMER, A. N., Superintendent of Schools, Evanston, Ill., and
HUNTINGTON, JANET RANKIN, State Department of Public Instruction, Wisconsin.

Food Problems. To Illustrate the Meaning of Food Waste and What May be Accomplished by Economy and Intelligent Substitution. 1918. 90 pp. **27 cents**

The Better Way



Cut No. 41

1 GALLON GASOLINE PUMP FOR INDOOR USE

Countless tests of the most severe character have proven Bowser Gasoline Storage Systems to be the "Better Way" to store and handle this volatile and inflammable liquid.

Gasoline is stored as safely as water. Fire cannot get to it—and in case of fire there is no danger—the Bowser is Fire-Proof.

BOWSER ESTABLISHED 1885

Oil *and* Gasoline Storage Systems

are built for any capacity or requirement. Measure accurately, prevent evaporation and deterioration. Are built of selected materials by expert workmen.

Write for interesting Fire Booklet

S. F. Bowser & Co., Inc.

Fort Wayne, Ind., U. S. A.

Sales Offices In All Centers

Representatives Everywhere

Cumberland, W. W., Ph. D., Assistant Professor of Economics, University of Minnesota, Manager, Markets Information Service, Minnesota Committee of Food Production and Conservation.

Coöperative Marketing. Its Advantages as Exemplified in the California Fruit Growers Exchange. 1917. viii + 226 pp. **$1.60**

Protests against that indefinite maladjustment commonly referred to as the High Cost of Living resulted in no concrete steps of importance to improve conditions, but the recent food propaganda for reduced consumption, for war gardens, and for public markets seems to be developed into a movement which, given sufficient time, will tend to effect a permanent reduction in the cost of life's necessities. The organization of communities for food production and conservation becomes more and more thoro and comprehensive, and there is already a tendency to carry the work into the adjacent territory and to bring the actual producers—the farmers—into the scheme. But this tendency is no new thing in certain sections of the West. Coöperative marketing there has already passed thru the initial stages of development. For this reason, Dr. Cumberland's book, which, as the sub-title indicates, deals largely with the California Fruit Growers Exchange, is particularly timely and should help civic officials and workers in other parts of the country who are faced with the problem and ready to undertake more far-reaching steps in the direction of coöperative marketing.

Dean, Arthur D., Sc. D., Professor of Vocational Education, Teachers College, Columbia University.

Our Schools in War Times—and After. 1918. viii + 335 pp. **$1.40**

In this book it is pointed out that to the schools of America the war has come as "an opportunity for developing a closer relation between education and life, between life and service." At the beginning of the war England almost wrecked her schools by suspending the attendance laws. Later, both France and England rectified their errors and developed their schools on a newer, better basis. One of the most valuable lessons for this country gained from European experience is the fact that we must not take our schools into the war, but must bring the war into the schools—and by this is meant that the schools must reälign themselves for greater practical efficiency and community service. Suggestions as to how this program can be worked out are discussed in this book. Some of the chapters are: War and Community Uses of Our Schools; The Field for Industrial and Trade Schools; Colleges and Technical Institutes; Opportunity for Manual and Household Arts; The Work Impulses of Youth; Organized Boy Power vs. Military Drill; Red Cross and Other Community Work; Reëducation of the Disabled; Farm Cadets; The Organization of a Cadet Camp; A Summarized Program of Action.

Zoning for Saint Louis.

Zoning for Saint Louis: A Fundamental Part of the City Plan. City Plan Commission, Harland Bartholomew, Engineer. January, 1918. 31 pp. Illustrated. (Apply to the Commission, St. Louis, Mo.)

A City Plan for Omaha.

Preliminary Studies for a City Plan for Omaha. Issued by the City Planning Commission, November, 1917. 88 pp. Maps, photographs. (Apply to the Commission, Omaha, Neb.)

Safeguarding the Street Plan.

Erection of Buildings Within the Lines of Proposed Streets Laid Down on the Final Map of the City of New York. Report by Robert H. Whitten, Secretary, Committee on the City Plan. 1917. 7 pp. (Apply to Municipal Reference Library, Municipal Building, New York City.)

Springfield, Ill., Survey.

City and County Administration in Springfield, Illinois. By D. O. Decker and Shelby M. Harrison. (Springfield Survey, Government Efficiency Section, SE 13.) October, 1917. 168 pp. Photographs and charts. (Apply to Russell Sage Foundation, 130 East Twenty-second Street, New York.) 25 cents.

McBain, Howard Lee, Dorman B. Eaton, Professor of Municipal Science and Administration in Columbia University.

American City Progress and the Law. (Series: Columbia University Lectures, the Hewett Lectures, 1917.) 1918. viii + 269 pp. **1.60**

The preface to this volume states: "Of the several important types of unit in our complicated system of government, the city operates under the largest number of restrictions imposed by written fundamental laws." In this statement is to be found the peculiar significance and value of this book to American city officials and civic workers, and those interested in improved conditions in our local governments will do well to read it with care. The powers of the municipal government are limited by charter, by the state, and by constitutional limitations, thus involving considerable reference to legal procedure before amelioration can be obtained. In this book attention is given to the laws affecting cities and the methods of approach for modifying and changing such laws. The matter is further indicated by the subjects treated: Home Rule by Legislative Grant; Breaking Down the Rule of Strict Constitution of Municipal Powers; Expanding the Police Power—Smoke and Billboards; City Planning—Building Heights and Zoning; City Planning—Excess Condemnation; Municipal Ownership of Public Utilities; Control Over Living Costs; Municipal Recreation; and Promotion of Commerce and Industry.

Groves, Ernest R., Professor of Sociology, New Hampshire State College.

Using the Resources of the Country Church. 1917. 160 pp. **75 cents**

The interest which this book holds for civic and community workers is shown in the suggestive chapter titles: The Church of the Small Community and City Drift; The Minister and the Conservation of His Social Experiences; the Church and the Conservation of Community Spirit; The Church and the Conservation of Recreation; The Church and the Conservation of Physical Health; The Church and the Problem of the Feebleminded, etc. The book throws new light on the moral aspects of the family, recreation, physical and mental health, and other elements in community life, and summons the country church to meet its supreme social opportunity.

Municipal Appropriations in Baltimore.

The Ordinance of Estimates for the Year 1918, Arranged According to Departmental Organization Units and also Classified under the Various Functions of City Government. . . . . with Detailed Statements of the Appropriations . . . for the Maintenance of the Government of the City of Baltimore for the Fiscal Year Ending December 31, 1918. 190 pp. (Apply to James F. Thrift, City Comptroller, Baltimore, Md.)

New Jersey State Bureau of Markets.

An interesting report of the work of this Bureau under the direction of Chief A. L. Clark in aiding in the establishment of municipal markets, etc., is contained in the Second Annual Report of the New Jersey State Department of Agriculture, issued as Bulletin No. 9 of the Department, November, 1917. 66 pp. (Apply to Mr. Clark, at Trenton, N. J.)

Recreation in Saint Louis.

Report prepared by the City Plan Commission, Harland Bartholomew, Engineer. November, 1917. 48 pp. Photographs, maps, tables. (Apply to the Commission, St. Louis, Mo.)

A Notable Survey of the Akron Schools.

Horace L. Brittain, Director of the Toronto Bureau of Municipal Research, acting for the Educational Committee of the Akron, Ohio, Chamber of Commerce, has made a very thoro survey of the school system of that city, published July, 1917, under the title "Report on the Schools of Akron." 234 pp. Photographs, charts, diagrams, statistical tables. (Apply to Vincent S. Stevens, Secretary, Chamber of Commerce, Akron, Ohio.)

A hard service tire must essentially be a good tire.

The 'NOBBY CORD' PNEUMATIC TRUCK tire is the sturdiest and biggest member of the United States Tire family—a tire that is backed by rugged outdoor experience and not by talk and factory experimentation.

Meets all service demands.

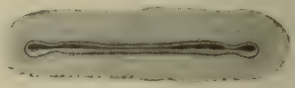
United States Tire Company
1790 B'way New York

United States Tires Are Good Tires

Fire Hose and Pan-cakes!

Did you know that Bi-Lateral Fire Hose could be flattened out like a pan-cake without the least sign of cracking or breaking?

Bi-Lateral Hose is so constructed by an improved method, that the lining in its jacket is left free at the fold. This prevents the rubber from cracking, and the lining will last as long as the jacket. Bi-Lateral Hose Lasts Longest.



Write for printed matter.

BI-LATERAL FIRE HOSE CO.
326 W. Madison Street, Chicago, Ill.

Save Your Money
Save Your Boy!

Buy Liberty Bonds

YOU HELP TO SAVE
AND
YOU SAVE TO HELP

This space donated by
THE DAYTON RUBBER MFG. CO.
DAYTON, O.
Makers of the popular "Dayton Airless Tire"

Esthetics in Bridge Design.

The article on "Esthetics in Bridge Design," which appeared in the Town and County Edition of The American City for March, has been reprinted in pamphlet form. Requests for copies should be referred to Waddell & Son, Consulting Engineers, 165 Broadway, New York City.

Health Service in New York City.

Facts and Figures Showing the Quantity and Cost of the Work of the Department of Health for a Five-Year Period, with a Summary of the Results to the Public Health. 1917. 20 pp. Charts. (Apply to the Department, 139 Centre Street, New York.)

Organizing Drainage Districts.

How to Organize Drainage Districts. By LeRoy K. Sherman. 1917. 18 pp. (Apply to author, 1102 Tacoma Building, Chicago, Ill.)

Society for Street Cleaning and Refuse Disposal.

Bulletin for the Society for Street Cleaning and Refuse Disposal of the United States and Canada, containing the Annual Report of the Secretary-Treasurer. (December) 1917. 22 pp. (Apply to Secretary-Treasurer, Jos. R. Buchanan, New York.)

The American City Pamphlets. (The complete list to date.) Price for the entire set, $3.00. Address the Civic Press, 154 Nassau Street, New York City.

Water Consumption of Cities. The Effect of Meters on Water Consumption. (Tables.) No. 98. 10 cents.

Some Fundamentals of Housing Reform. By Dr. James Ford, Harvard University. No. 99. 15 cents.

The Esthetic Treatment of City Bridges. By Henry Grattan Tyrrell, C. E., Consulting Engineer, Evanston, Ill. No. 101. 15 cents.

How to Organize a City Planning Campaign. By Frederick Law Olmsted. No. 102. 15 cents.

Public Laundries in America. By Donald B. Armstrong, M. D., Superintendent Bureau of Public Health and Hygiene, New York Society for Improving the Condition of the Poor. No. 102a. 10 cents.

The Duty of Municipal Food Inspection. By William P. Capes. No. 104. 10 cents.

Fighting Fires Before They are Lit. By Martin H. Ray. No. 105. 10 cents.

How to Promote the Planting and Care of Shade Trees. By J. J. Levison. No. 106. 10 cents.

The Efficient Utilization of Water Storage Reservoirs. By George W. Fuller. No. 107. 10 cents.

The City's Need, the University's Opportunity. By Herman G. James, J. D., Ph. D. No. 108. 10 cents

A Notable Development in Ornamental Street Lighting. By Walter C. Allen. No. 109. 10 cents.

How to Determine Relative Values in Sanitation. By George C. Whipple. No. 110. 15 cents.

Co-partnership in Housing in Great Britain. By Henry Vivian, J. P. No. 111. 15 cents.

Relation of the Motor Bus to Urban Development. By F. Van Z. Lane. No. 112. 15 cents.

Has Your City These Maps? By William P. Capes. No. 113. 10 cents.

Water Supplies and the Part They Play in City and County Planning. By Charles W. Leavitt, Jr. No. 114. 15 cents.

Chambers of Commerce and City Planning. By George B. Ford. No. 115. 10 cents.

The Modern Park Cemetery. By Hare & Hare. Landscape Architects, Kansas City, Mo. No. 116. 15 cents.

Public Comfort Stations; Their Economy and Sanitation. By Donald B. Armstrong, M. D. No. 117. 15 cents.

Rose Valley—A Garden Suburb (near Philadelphia). No. 118. 10 cents.

Public Health Work in Rural Communities. By Samuel A. Greeley, C. E. No. 119. 15 cents.

Public Bath Houses and Swimming Pools. By Dr. William Paul Gerhard, C. E. No. 120. 20 cents.

Civic Unification of a Small City. By Frank Koester, Consulting Civic Engineer. No. 121. 15 cents.

A Model Wet-Wash Laundry. By Philip S. Platt, M. A. No. 122. 10 cents.

A Combination of Municipal and Privately Owned Utilities. By G. B. Baskerville, Jr. No. 123. 10 cents.

A List of City-Planning Reports. No. 124. 15 cents.

Handicaps to Legal Bond Issues. By Robert R. Reed. No. 125. 10 cents.

City Planning and Real Estate. By George B. Ford. No. 127. 10 cents.

Coniferous Evergreens and Evergreen Shrubs for Parks and Public Grounds. By H. E. Holden. No. 128. 15 cents.

Points of Difference in Water Works Franchises. By Philip Burgess. No. 129. 10 cents.

Engineering Coöperation—A Plan for Municipal Economy in Small Communities. By Frederick Bass. No. 130. 10 cents.

A Step Towards Solving the Industrial Housing Problem. By Warren H. Manning. No. 131. 10 cents.

The Jitney Bus. By Clyde Lyndon King, Ph. D. No. 132. 15 cents.

Sheet Asphalt Pavements. By Daniel T. Pierce. No. 133. 15 cents.

How to Avoid Root Growth in House Sewers. By William Robert Marshall. No. 134. 10 cents.

Organizing Rochester's School Boys for Accident Prevention. By Roland B. Woodward. No. 135. 10 cents.

Municipal Clinics for School Children. By Edward F. Brown. No. 136. 10 cents.

How a Small Municipality is Profiting by a City Plan. No. 137. 15 cents.

Precautions to be Used in Securing Successful Bituminous Macadam Pavements. By Philip P. Sharples. No. 138. 15 cents.

Needed in Every City—Adequate Power and Common Sense in Fire Prevention. By Clement J. Driscoll. No. 139. 10 cents.

Sewage Disposal by the Activated Sludge Process. By William B. Fuller. No. 140. 10 cents.

Preparing to Abolish the Mosquito. By P. L. Buttrick. No. 142. 15 cents.

Improved Granite Block Pavements. By Z. W. Carter. No. 143. 15 cents.

Motor Trucks for Refuse Collection. By Samuel A. Greeley. No. 146. 15 cents.

Public Comfort Stations. By Wm. Paul Gerhard. No. 147. 20 cents.

Hand Flushing—Its Place in the Street Cleaning Field. By Raymond W. Parlin. No. 148. 15 cents.

The First Roadside Planting Along the Lincoln Highway. By Wilhelm Miller. No. 149. 15 cents.

Town Planning Achievements in Walpole. By John Nolen. No. 150. 10 cents.

The Assessments of Benefits and Damages in Street Proceedings. By Herbert S. Swan. No. 151. 15 cents.

The Courts and Excess Condemnation. By Charles Reittel. No. 152. 10 cents.

Planning Street Widths for Street Needs. By Nelson P. Lewis. No. 153. 10 cents.

Infantile Paralysis and Cleanable Streets. By R. H. Bishop, Jr., M. D. No. 154. 10 cents.

A "Home Made" City Planning Exhibit and Its Results. By Geo. A. Damon. No. 155. 20 cents.

Control of Highway Work by Means of Planning Boards and Current Status Visible Records. By William H. Connell. No. 156. 20 cents.

The Evansville Plan. By Henry C. Murphy. No. 157. 10 cents.

How Much Playground Space Does a City Need? By Rowland Haynes. No. 158. 15 cents.

Coöperation Between a Public Library and Civic Organizations. By W. Dawson Johnston. No. 159. 10 cents.

Ways and Means of Providing Workingmen's Houses. By Perry R. MacNeille. No. 160. 10 cents.

Building a Community Thru Its Resident Forces. By Frank H. T. Ritchie. No. 161. 20 cents.

The Small-Town Refuse Problem. By George W. Simons, Jr. No. 162. 10 cents.

Coöperation the Keynote in Dallas Public Health Activities. By Charles Saville. No. 163. 15 cents.

The Deveopment of the Industrial Section. By A. Pearson Hoover. No. 164. 15 cents.

Industrial Recreation. By O. W. Douglas. No. 165. 10 cents.

Planning Sunlight Cities. By Herbert S. Swan and G. W. Tuttle. No. 167. 20 cents.

Coöperative Delivery Systems. By Raymond B. Gibbs. No. 168. 10 cents.

The Honor System in the Use of Prison Labor for Road Construction. By S. M. Williams. No. 169. 10 cents.

The Swimming Pool and Its Operation. By J. J. Hinman, Jr. No. 170. 15 cents.

MUNICIPAL SURVEYS

A quick and effective way for city and county governments to reduce expenditures, increase revenues and give more and better service. Special attention to

Salary Standardization
Accounting
Audits
Charter Drafting
Budget Systems

Police and Fire
Highways
Health and Charities
Institutions
Schools

Public Utility Service and Rate Studies
Refuse Collection and Disposal
Methods of Taxation, Etc.

12 years' experience throughout U. S. and Canada. Write for literature. Estimates furnished.

BUREAU OF MUNICIPAL RESEARCH, 261 Broadway, New York City

Four-Wheel Drive
Aerial Ladder Truck

Pneumatic Air Hoist
Automatic Ladder Lock

One man puts the ladders where you want them. No More Cranking.

Write for free booklet and list of users

COUPLE-GEAR FREIGHT-WHEEL CO., 525 Buchanan Ave., GRAND RAPIDS, MICH.

Hooray! They're Makin' a Playground!

That's why the kids are so happy. They know that a playground in their vicinity will mean no end of fun for them. You can make all the kids in your town happy. Write me for printed matter on how to plan and equip a model playground.

HOWARD GEORGE
Philadelphia - Pa.
"The Playground Outfitter"

The Anderson Coupling & Fire Supply Company

KANSAS CITY, KANSAS

Manufacturers of

MOTOR FIRE APPARATUS

General Fire Department Supplies

Anderson-Hale Fire Station Door Openers

Estimates Cheerfully Given

Loper Fire Alarm Co.

STONINGTON, CONN.

Manufacturers of

Compressed Air Fire Whistles
Whistle Blowers
Bell Strikers, Boxes, Gongs
Etc., Etc.

Estimates Cheerfully Given

Methods, Materials and Appliances

News From Boards of Public Works, Engineers, Contractors, Purchasing Agents and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Potsdam's New Town Lockup

One of the latest installations of modern jail equipment is that of Potsdam, N. Y. Approximately $2,700 has been expended in repairing and improving the old fire station, which was erected in 1891 and till within the last few years housed both the fire department and the police department. The jail portion consisted of two antiquated wooden cells in the rear of the building. For several years prior to the construction of the new cells, the jail had been regularly condemned by the inspector of prisons.

With the completion of the new central fire station in Potsdam, the fire apparatus was removed from the old quarters, and it was determined to remodel that station into a modern police headquarters. Accordingly, the old cells were ripped out, and a brick partition was constructed across the building, making a cell room 35 x 20 feet. A concrete floor was laid, and a pit constructed at one side for the heating plant. This is shut off from the rest of the room by a steel grating, which extends to the ceiling. A contract was entered into with the E. T. Barnum Iron Works, Detroit, Mich., which specializes in jail work and accessories; and six modern steel cells were installed by this company. These cells are of the self-locking type, and have solid steel floors and ceilings. As may be seen from the illustration, they are light and spacious. Provision is made for the comfort of the prisoner. A steel lattice-work bunk is built into one side of the cell, and each cell is supplied with running water. The whole cell-room is well ventilated, and neat in appearance; it has barred windows on three sides, the bars being built into the masonry of the walls. Two solid steel doors open respectively into the officers' room at the front of the building, and to the outdoors.

At the front of the building are two offices, one of which serves the purposes of a court room. The other is the chief's private office. A steel stairway leads to the upper floor, where quarters have been provided for women and children. A steel door at the head of the stairway effectually shuts off the rooms from any exit. A room with cots for four has been provided for vagrants. Altogether, the capacity of the building is twenty-five persons, and it is expected that this will be more than ample for the town for some time to come.

Courtesy of E. T. Barnum Iron Works, Detroit, Mich.

THE NEW JAIL AT POTSDAM, N. Y.

Potsdam may be justly proud of its modernized police station, which is one of the best in any municipality of its size in the state. And there is little doubt that this improvement will react to the benefit of Potsdam

—yes, some twenty years ago

Twenty years ago, we made a big lot of Enameled Iron Street Signs for the City of Baltimore, but we haven't sold the City many since—only because

THE TOWN HASN'T NEEDED THEM

The signs we sold them twenty years ago are still doing business—that's the economy of "BALTO" Guaranteed Porcelain Enameled Iron Municipal Signs.

That's the proof that there is no "just-as-good."

If you can afford to experiment with low prices (?) you're fortunate, but the taxpayer pays the freight. Our product is the one absolutely dependable out-of-door municipal sign on the market, and we can prove it if given half a chance.

GIVE US THE CHANCE TODAY

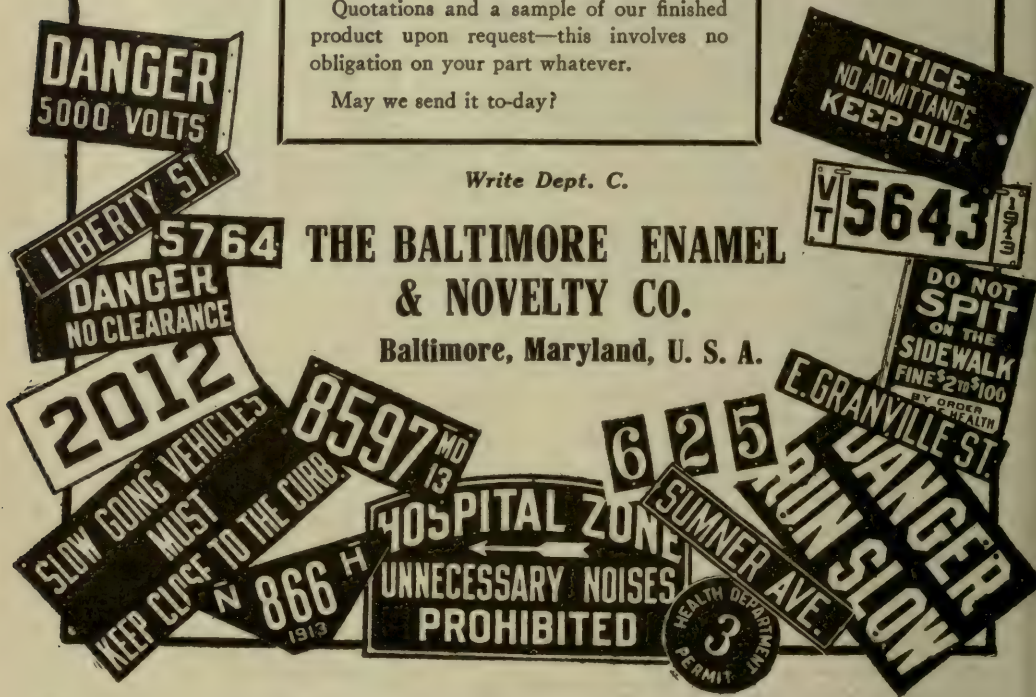
Quotations and a sample of our finished product upon request—this involves no obligation on your part whatever.

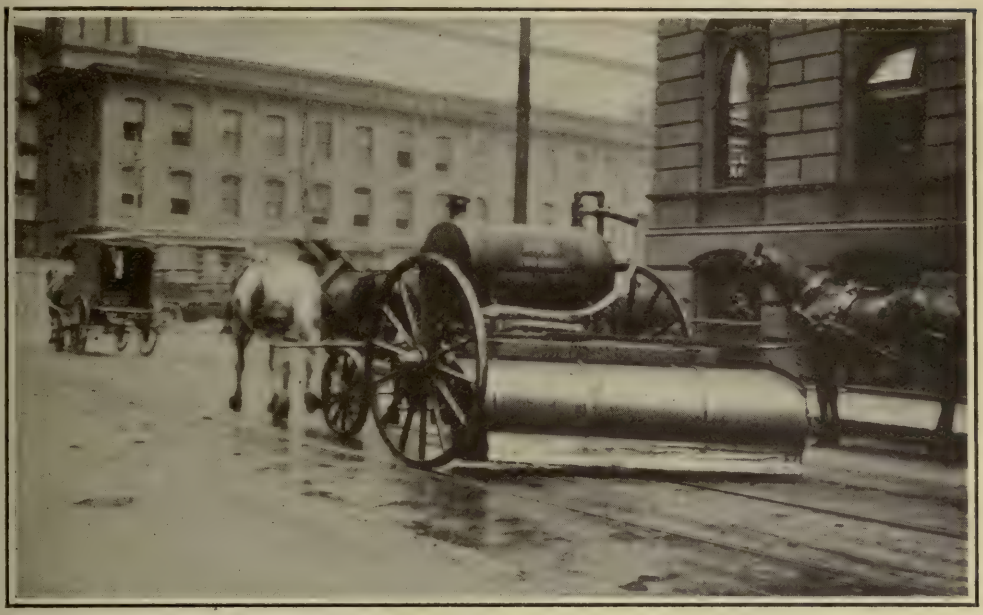
May we send it to-day?

Write Dept. C.

THE BALTIMORE ENAMEL & NOVELTY CO.

Baltimore, Maryland, U. S. A.





THIS MACHINE COMBINES SPRINKLING AND SWEEPING

A Dustless Street Sweeper

Many street cleaning departments send sprinkling carts ahead of their sweepers to lay the dust, so that the sweeping broom will not merely toss the dirt into the air to settle back on the street. The latest practice, however, combines these two machines in one, and thus effects a saving of time, labor and money.

The illustration gives a good general idea of the noteworthy features of the Austin two-speed sprinkler sweeper, manufactured by the Austin-Western Road Machinery Co., Chicago, Ill. Its foundation is that of the Austin Standard street sweeper, which has been widely used and appreciated for twenty-five years past. The additions to the original sweeper, however, are deserving of special consideration.

A 200-gallon tank provides water to lay the dust ahead of the broom. The flow is so adjusted that the water may be applied in four different quantities, according to the necessity for a greater or less amount to make the dirt mealy. The broom can, of course, be readily thrown in or out of gear by the operator without leaving his seat, and is capable of several pressure adjustments for light or heavy pavement work. But in addition to this, and unlike many other sweeper brooms, the Austin broom can be operated at two different speeds. The advantage of this feature lies in the fact that when the sweeper approaches a spot in the street that is particularly dirty and hard to get at, the driver can throw the broom into high gear. This causes it to revolve about 50 per cent faster than it does ordinarily, and naturally this increased energy loosens up the dirt and throws it aside more efficiently than the broom could do at its ordinary speed. Another important advantage of the high speed is that as the broom wears down to a smaller diameter it ordinarily loses its efficiency when revolved at the same rate as when it was new; but if the small diameter broom is revolved by high-speed gears, it travels over the pavement at the same or a slightly better speed than did the full-sized broom. As a consequence, the broom can be worn down practically to the sprockets and still retain its full cleaning efficiency.

Another feature that claims attention is the sheet iron and canvas housing over the broom to eliminate dust. This makes it possible to operate the sweeper on heavy traffic streets without creating a nuisance.

The machine requires one man and a team of horses for operation, and, it is claimed, will clean an average of 8,000 square yards per hour at an average cost, considering the country as a whole, of 8 cents per thousand square yards for each cleaning.

Better Methods for Sewer Pipe Installations

With the broad object of improving installation methods for vitrified clay pipe, the Wyatt Engineering Company of Columbus has perfected its organization and commenced manufacturing operations in Columbus, Ohio. It is also the purpose of the company to offer its services as consultants in sewer work and other operations entailing the use of vitrified pipe.

DeWitt H. Wyatt, for whom the company is named, is the inventor of the Flex-Form

Folk Dance and Game Books For Schools and Playgrounds

The plays, dances and games described in these books furnish wholesome and beneficial exercise as well as pleasure and recreation for growing children.

Bear in mind that the days at school are the "foundation" days. Help the children to lay a good, strong and sturdy one—in mind and body.

Look over this list of books—any one or all will be sent on approval.

Send for circular giving Table of Contents of each book.

Write now while on your mind.

The Song Play Book. Wollaston and Crampton	$1.80
The Second Folk Dance Book. Crampton	1.80
The Playground Book. Sperling	2.00
More Song Games. Bremmer	1.60
Aesthetic Dancing. Rath	1.60
Dramatic Games and Dances. Crawford	1.80
The Festival Book. Lincoln	1.60
The Folk Dance Book. Crampton	1.80
Swedish Folk Dances. Bargnquist	1.60
Folk Dances and Games. Crawford	1.80
Plays and Games for Indoors and Out. Parsons	1.60
Graded Games and Rhythmic Exercises. Newton	1.40
Song Games and Ball Games. Bremner	1.40
Play Songs. Bentley	1.60
Rhythms of Childhood. Crawford	1.80

The A. S. Barnes Co. - 381 Fourth Ave. - New York

Expert Advice and Service *for* Park Departments

Do you know what your costs are?

Do you know whether you are getting value for your money?

Would you like system and business method put into effect?

Let me tell you how to do this and get the most out of your park system.

This is a real service by expert and skilled persons.

We will put business methods into park maintenance and development. We will show you how to save money and get increased results.

Write for Detailed Information.

Benjamin E. Gage
30 N. La Salle St. Chicago, Ill.

THE GAMEWELL FIRE ALARM TELEGRAPH CO.

"Registered U. S. Patent Office"

Manufacturers of Fire Alarm and Police Signal TELEGRAPHS for Municipalities and Private Parties

The Gamewell system of to-day is the outcome of the combined inventive genius and mechanical skill of many whose valuable services the company has been able to secure during the past fifty-seven years, in pursuance of its policy of meeting at any cost the requirements of the varied conditions existing in different localities.

Correspondence Solicited.

General Office and Works: Newton Upper Falls, Mass.

runner or mold, used in the rapid production of poured joints for vitrified pipe. The initial task of the company is the production of the Flex-Form and its introduction in every kind of underground work where tightness in the joint is essential.

Mr. Wyatt has associated with him as an organizer of the company W. C. Groeniger, state plumbing inspector of Ohio and one of the foremost authorities on the subject of house drains and house sewers. Mr. Groeniger has been requisitioned by the Federal Government and is now on his way to Jerusalem to help solve the sanitary problem encountered by the allied forces in the ancient Hebrew capital, where it is said a million people are living within the area of a square mile and without any sort of modern sanitation. Before leaving, Mr. Groeniger wrote a complete specification for the installation of vitrified house drainage, using the Flex-Form joint, as well as a specification for testing, which will be the basis of the company's propaganda for tight house drains.

It is expected shortly to announce a method of pouring grout joints that will permit immediate backfilling on large sewer operations using excavating machinery. Another of the Wyatt projects is the installation of interior vertical stacks of vitrified pipe under a specification that promises to meet every objection on the score of security and permanence.

Detroit to New York by Express Truck

In order to help relieve railroad congestion and, at the same time, insure prompt deliveries of tires to their dealers, the United States Tire Company, with headquarters at 1790 Broadway, New York City, has established a system of motor truck transportation between Detroit and New York.

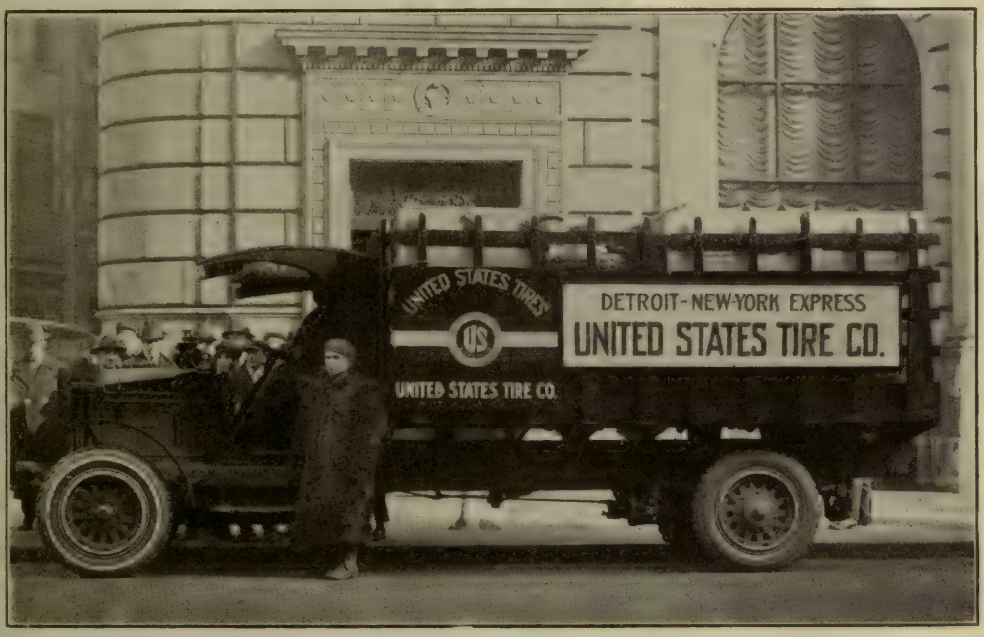
The first truck, loaded with 4,300 pounds of tires for the metropolitan district, arrived at New York from the Detroit factory of the tire company after bucking fierce snowstorms on the way east.

The big vehicle, a 2-ton Pierce-Arrow, was equipped with "Nobby Cord" pneumatic truck tires, and in spite of the strenuous work they were called upon to perform, neither truck nor tires showed signs of wear.

The run from Detroit to Buffalo was made in 28½ hours—excellent time when the conditions were taken into consideration. Between Buffalo and Albany the truck encountered the worst roads and heaviest snows of the trip. Snowdrifts completely obscured the roadbed, making it impossible for the driver to avoid the ruts. This not only slowed down the speed of the last half of the journey, but added materially to the wear and tear on the truck and tires. The United States Tire truck followed an army convoy of sixty trucks out of Buffalo, leaving them at Amsterdam a few hours before arrival in New York City.

Louisville Chief Engineer Resigns

Word has been received that D. R. Lyman, for the last eight years chief engineer of the Department of Engineering of Louisville, Ky., has resigned. His resignation took effect April 1.



THE BIG TRUCK WHICH CARRIED 4,300 POUNDS OF TIRES FROM DETROIT TO NEW YORK

City Officers—Auditors, Clerks, Engineers, Superintendents of Streets

Do away with waste of time and the possibility of costly errors by using the

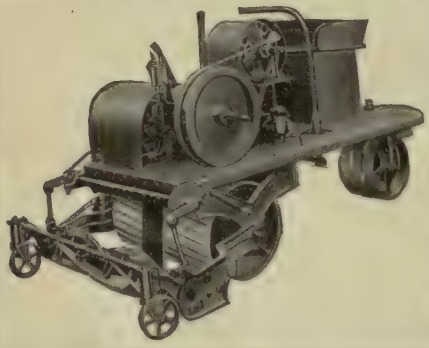
Marchant Calculator

The Marchant is used for

Tax extensions, checking footings, decreasing or increasing valuations, figuring fees, establishing levies, interest on county warrants, interest on tax delinquencies, bond and redemption interests, and in fact for all calculations.

MARCHANT CALCULATING MACHINE CO. Dep't L. **Emeryville, Oakland, Cal.**

Eastern Representative, 465 Drexel Building, Philadelphia, Pa.



The Milbradt Power Lawn Mower

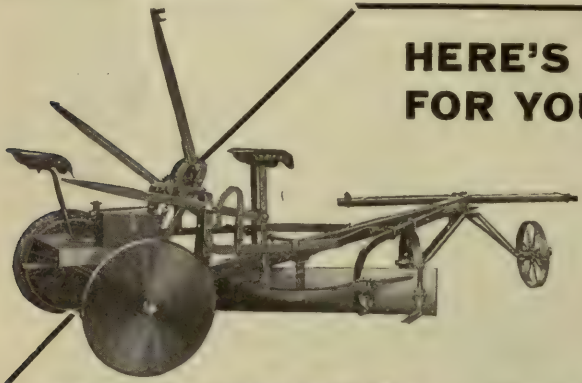
The Milbradt is a perfect power lawn mower. It will cut the grass close and clean, do it quickly and economically; a machine so simple in construction and operation that any one can handle it.

It cuts a swath 38 inches wide and has a speed twice the gait of a horse.

We will ship a mower on approval and guarantee same to be satisfactory in every respect.

Write for Circular Matter

MILBRADT MFG. CO. : St. Louis, Mo.



HERE'S A HANDY GRADER FOR YOUR STREETS—

Nothing clumsy about this. Two to four horses pull it. Does the work of graders twice its weight. Fine for your city dirt streets and for cleaning gutters. Your city should own a

BAKER 20th CENTURY GRADER No. 2

Doesn't slip nor slide. It's light but strong. Direct pull on the moldboard. Easily handled by quick acting levers. Quickly turned around. Goes anywhere. Shifting axle. Reversible Moldboard. A small machine that does big work. Completely guaranteed.

We also manufacture: Road Drags, Road Levelers, Dump Boxes, Pick-up Sweepers, Street Carts, 4-wheel Scrapers

Big catalog sent on request

THE BAKER MFG. CO. 530 Stanford Ave., Springfield, Ill.

FIGURE HOW MANY FREIGHT CARS WOULD HAVE BEEN WITHDRAWN FROM WAR SERVICE IF THESE TRUCKS HAD BEEN SENT BY RAIL

Cutting the Traffic Tie-Up

A scene such as that pictured above conveys, in a small way, some idea of the enormous amount of freight space that would be released for the shipment of war munitions and other urgently needed supplies which are at present lying in congested railroad yards, if every motor-driven vehicle were to be delivered overland from the factory to the purchaser. That this method of delivery is practicable is well brought out in the following statement by C. R. Norton, General Sales Manager, Packard Car Company, Detroit, Mich.:

"Driving motor vehicles overland at this time is a patriotic, as well as a convenient, measure. It releases cars for imperative war shipments and relieves the purchaser of the delay certain to be incurred should he depend on the congested and embargo-burdened railroads for delivery. The vehicle will arrive in practically the same condition as if it had come by freight; in fact, it is improved by being 'worked in' under the care of expert drivers and our Packard service establishments along the route. I recommend that the purchaser of every Packard vehicle—commercial or passenger—arrange with his dealer to have it driven overland. This action will benefit country and customer."

The feasibility of inter-city travel in winter was proved when the first army truck train of thirty Packards pioneered the way over 580 miles of snow-filled, ice-covered roads, between Detroit and Baltimore. This train, which is the one shown herewith, started December 14, and arrived in Baltimore December 28. The actual running time was 11 days, three days being allowed the men to rest on the way. The average running time for the 14 days was 41 miles daily, and for 11 days, 53 miles daily. This average is not so bad for an initial run, especially in consideration of the weather conditions. Between Detroit and Pittsburgh, extreme cold and deep snows made the going hard. The roads in Michigan were in very bad shape, but less trouble was encountered in Ohio. While the Lincoln Highway, along which the train traveled between Pittsburgh and Baltimore, was well cleared of snow, the mountainous country, with steep hills and declines, and dangerous turns, made it necessary for the trucks to move cautiously. However, the success of this venture has warranted the adoption of this delivery system by the Packard Company, and six additional army trains will have reached the coast by the time this item is published, with six more strung out between the factory and eastern points.

Trussed Concrete Steel Company Changes Name

It frequently happens that a company which has taken its name from its original output so broadens its field in its successful growth that the old name is no longer adequate to cover its wider range of activity in manufacturing. Such is the case of the Trussed Concrete Steel Company, Department C-43, Youngstown, Ohio, which at first devoted itself exclusively to reinforced concrete, introducing many new reinforcing products, such as the Kahn Bar, Floretyles, etc. For many years, however, the activities of this organization have expanded far beyond the concrete field so as to include a large variety of steel products. Hence it has been found desirable to select for the company a name more truly representing its great variety of products, and the name "Truscon" was chosen. So the company will henceforth be known as the "Truscon Steel Company," with headquarters as hitherto in Youngstown, and with no change in its organization or management.

Hauling Cannon by Auto Truck

"Somewhere on the coast" near San Francisco the Government faced a problem. It consisted of moving four 28-foot guns, weighing ten tons each, a distance of seven miles over roads so winding that it constituted a very difficult and delicate undertaking. After several hauling contractors had given up the riddle, one was found who agreed to try it. He proposed to move the guns, one at a time, by means of a standard Garford 5-ton truck.

The haul was from the beach in sand varying from 3 to 9 inches in depth, over a very winding road to the highway. This could be negotiated only by a short wheelbase truck such as the Garford, on account of the sharp turns; and, even so, at times the front of the truck and the end of the gun were rubbing the bank.

The haul took five hours to the gun. The removal of the four guns had formerly required four days, with three times the equipment, as against two days with the auto truck. Needless to say, the Quartermaster's Department was highly pleased with the ease and rapidity with which this difficult task was performed.

A view of the truck and its load will be

ESTABLISHED 1866

BARNUM JAIL CELLS

JAIL WORK of EVERY DESCRIPTION

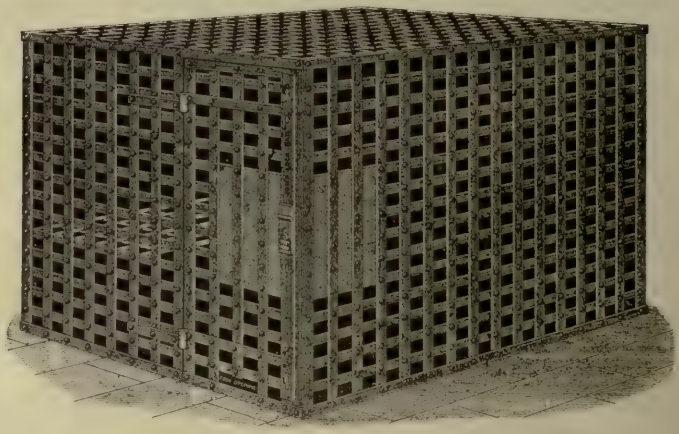
Jail Entrance Doors

Steel Lining for Jail Walls

Jail Bedsteads

Steel Window Guards

Iron Stairs



Folding Steel Bunks

Tool-Proof Steel Work

Sanitary Equipment

Locking Devices

Padded Cells

SEND FOR CATALOGUE

E. T. BARNUM IRON WORKS

DETROIT, MICHIGAN

MOTT LAMP POSTS

STANDARDS OF MERIT

Special Designs of Lighting Standards For Type C Lamps

LAMP POSTS FOR ALL REQUIREMENTS

FOUNTAINS

Display and Drinking

For PUBLIC SQUARES, PARKS, PLAYGROUNDS, Etc.

ENTRANCE GATES, RAILINGS, SETEES

CATALOGUES ON APPLICATION

THE J. L. MOTT IRON WORKS

Fifth Avenue and 17th Street, New York

found in our department of "Motor Apparatus in Many Kinds of Service," on page 343 of this issue. It is interesting to note in passing that while the truck had a rated capacity of 5 tons it experienced no difficulty in handling this 10-ton haul.

A Faithful Servant

Seven years of active service and still going strong!

The illustration shows the fire apparatus at Lenox, Mass., making a quick getaway in response to an alarm. This equipment is the first piece of gasoline motor fire apparatus to be built by the American-LaFrance Fire Engine Company, Elmira, N. Y. It has been in service in Lenox since 1910, and, as the illustration shows, is to-day giving the same efficient service that it rendered when it was new.

THIS MOTOR FIRE ENGINE HAS HAD SEVEN YEARS OF ACTIVE SERVICE IN LENOX, MASS.

This record, however, is not the only one to which the American-LaFrance Company can point as proof of the lasting quality which is built into their apparatus. The following letter from Racine is taken from the November bulletin of the company:

Racine, Wis, October 27, 1917.

American-LaFrance Fire Engine Co., Inc., Elmira, N. Y.:

Gentlemen: We have had an American-LaFrance Type 5 combination chemical and hose car in service for six years and seven months. During this time the car has given the most perfect satisfaction, and the only repair expense, outside of the replacing of tires, we have had was $28.00, caused by running into a junk wagon. The car has never failed to respond to an alarm, and at the present time seems as good as new. This car has responded to from 85 to 150 alarms each year since she has been in service.

Yours very truly,

JAMES CAPE,
Chief of Fire Department.

Appointments in Worthington Corporation

The Worthington Pump and Machinery Corporation, 115 Broadway, New York City, announces the following appointments, effective March 1, 1918: James E. Sague, vice-president, in charge of Engineering and Manufacturing; Leon P. Feustman, Vice-President, in charge of General Commercial Affairs, including Contracts, Prices, Purchases, Traffic, etc.; Frank H. Jones, Vice-President, in charge of Sales; William Goodman, Assistant to Vice-President; William Schwanhausser, Chief Engineer; Neil C. Lamont, Works Manager, Laidlaw Works, with office at the works, Elmwood Place, Cincinnati, O.; Edward T. Fishwick, General Sales Manager; Charles E. Wilson, Assistant General Sales Manager. With the exception of Neil C. Lamont these officers will make their headquarters at 115 Broadway, New York City.

Mark Wolff Resumes Practice as Certified Public Accountant

Mark Wolff, C. P. A., formerly Public Utility Accountant to the Mayor of New York City, announces that he has now located his offices at the Marbridge Building, Broadway and Thirty-fourth Street, New York City, for the general practice of accounting, systematizing and production engineering. In his capacity as public utility expert Mr. Wolff was active in investigations of public utilities which led to substantial reductions in rates to consumers.

Medart Playground Apparatus

Medal Tests stimulate Playground Activities and elevate the standard of physical efficiency.

Medart Medals of gold, silver and bronze are furnished free, together with carefully prepared efficiency tests.

Write for Catalog "W." It explains the Medart Medal System, as well as being a recognized guide on Playground Equipment.

FRED MEDART MFG. CO., St. Louis, Mo.

Gymnasium Outfitters—Steel Lockers

ALL MUNICIPALITIES NEED PLAYGROUNDS

The Playground not only betters the physical and moral tone of a city, but it is a real live investment. It cuts the perpetual moving population to a minimum which saves your manufacturer and your merchant.

American Apparatus will produce results.

WRITE FOR OUR CATALOGUE TO-DAY

AMERICAN PLAYGROUND DEVICE CO., W. 25th St., Anderson, Ind.

Signs That Endure

If the facts revealed by careful investigations of the causes of enamel sign failure are to be given due weight, the "small bad boy" is by no means the only explanation of badly peeled, illegible street and warning signs. It has been found that faulty construction and poor material are largely responsible for unsatisfactory service on the part of enamel signs. Another

AN ADJUSTABLE SIGN FOR ROAD INTERSECTIONS

very active source of trouble has been brought to light. This is the very general practice of fastening enamel signs to trees or poles by means of bolts inserted thru the plate proper. The action of the winds and elements and the vibration caused by the passing of heavy vehicles cause constant friction between the bolt and the enamel. As a result, the bolt shortly cuts into the enamel, and the peeling spreads rapidly until the sign is illegible.

The signs shown in the accompanying illustration were made by Joseph N. Early, 320 Broadway, New York City, and, as can readily be seen, are so constructed as to overcome the difficulty just mentioned. They are well protected by tough frames of malleable iron. There are no holes of any kind in the sign plates, and all the fastening is done on the frames in such a way that there is no strain on the plates. Thousands of such signs are doing service to-day all over the country that are as legible now as they were ten years ago, when they were first installed.

A feature of the Early signs that specially commends them to the shrewd buyer is appreciated in the signs designed for roads that cross at acute angles. These are adjustable to any angle, and can be secured for any number of intersections, so that streets or roads are not disfigured by signs that are misleading.

In short, the manufacturer of these signs has aimed at quality and durability, rather than at an inferior sign that could sell at a low price. For, after all, "the signs that pay are the signs that stay."

A Portable Testing Meter That Saves Money

How does your city test its meters? If yours is the average community, you probably cut the meters out of the line, load them on a wagon and take them off to the shop to be tested. This means the employment of two men, a truck, and the loss of a great deal of time in carrying the meters back and forth between the shop and the consumer's home.

The Neptune Meter Company, 50 East 42d Street, New York City, has found the remedy for this hitherto "necessary evil." Instead of "bringing the mountain to Mohammed," "Mohammed goes to the mountain," as he should. The illustration tells, better than words, just what the saving is over the old method. The Neptune portable testing meter is an instrument which enables the waterworks official to obtain quick, accurate tests

CARRYING THE TESTER TO THE METER

of all meters with a minimum of expense, and without removing the meter from the line. The test meter is of the Trident disk type. The initial hand makes a full revolution of the dial, and registers in hundredths of a cubic foot. The percentage of error can be determined at a glance. The meter is light in weight, especially designed for convenient carrying, so that one man with a portable

EVERYTHING for the PLAYGROUND

PROGRESSIVE CITIES EQUIP THEIR PLAYGROUNDS WITH

THE FUN-FUL LINE
PLAYGROUND EQUIPMENT

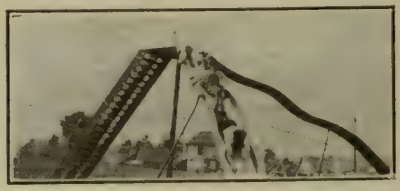
In use in scores of cities all over the country.

Fun-Ful Apparatus is safe, modern, durable and economical.

Write for illustrated catalog

HILL-STANDARD CO.

216 FUN-FUL AVENUE
ANDERSON, IND.



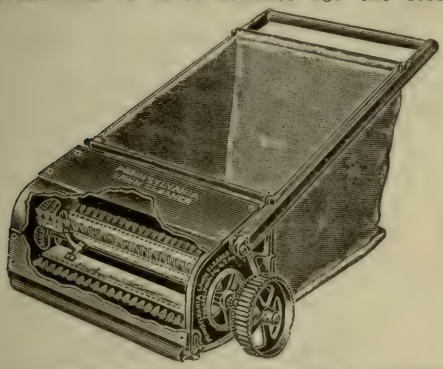
meter can carry out more tests in a single day than could be made in a week by the old method of cutting the meter out and taking it to the shop.

Perhaps the story is best summed up in this extract from a letter from Albert E. Walden, Superintendent of the Baltimore County Water and Electric Co., Baltimore, Maryland, as it gives the most potent of arguments—experience:

"It has saved this company hundreds of dollars, as it enables a test to be made of the meter right on the consumer's premises without removal of the service meter, thereby demonstrating to the consumer himself the accuracy of the meter."

A Versatile Lawn Cleaner

The illustration shows an adaptation of the Pennsylvania lawn cleaner and rake, made by the Pennsylvania Lawn Mower Works, Inc., John Braun & Sons, Philadelphia, Pa. By the substitution of three brushes for the steel-



A COMBINATION RAKE AND LAWN CLEANER

toothed rakes ordinarily used, this machine is converted into a very effective device for removing worm casts from lawns without injuring the turf, and in about one-tenth the time consumed by the usual methods.

THE FIBRE BRUSH WHICH PICKS UP THE LITTER

These brushes, as the illustration shows, are so made that they may be adjusted to take up the wear of the fibre, and therefore may be used effectively until they are entirely worn out. They are made of high-grade fibres set in a hardwood head, and, in addition to the function for which they were designed, can be used to advantage in cleaning lawns and sidewalks, for removing leaves and other litter. The refuse is picked up and tossed into the canvas receptacle. The suction created by the revolving brushes gathers in the dust and finer particles.

A convenient feature of this cleaner is the ease with which the change from brushes to rakes, or vice versa, is made, without the necessity of taking the machine apart. To summarize its advantages, the lawn cleaner and rake combines the offices of rake and wheelbarrow, thus effecting a saving of time and labor; it is easy of operation; and it is adaptable to varying needs and circumstances. It should therefore be an investment well worth the consideration of park officials and others whose work includes the care and upkeep of lawns and golf greens.

Do You Believe in Signs?

"Where there's a sign, there's a reason." The chief function of a sign is to attract attention. It therefore logically follows that a sign, to be effective, must be so made that it will arrest the eye and convey its message quickly and clearly. All other considerations are secondary to this.

An effective sign is here shown before the McKinley Monument, Buffalo, N. Y. It is designed by the Buffalo Municipal Equipment Co., Mutual Life Building, Buffalo, N. Y. The base is cast from the best quality grey iron, and is constructed with a view to firm

TRAFFIC GUIDE IN FRONT OF McKINLEY MONUMENT, BUFFALO, N. Y.

stability. It is reinforced, to take the heavy wear and tear that it is sure to meet. A wrought iron pipe standard supports the disk, which is also made to withstand rough usage. The cast-in raised letters can readily be refinished, and are not easily chipped or mutilated. They are so spaced that they are legible at a considerable distance. The whole sign presents an attractive, dignified appear-

REGISTERED
THE MARK OF QUALITY — ECONOMY — IT PROTECTS THE USER
U. S. PAT. OFFICE

Drawing Tables and Filing cases in stock for immediate shipment.

Styles No. 0, No. 1, No. 2.

The stability of these tables, their large drawing tops and the convenience of the drawer space and tool tray will save enough of any engineer's time to pay for a table every six months.

Style No. 6. Tops 36 x 48 to 43 x 72.

The most convenient Iron base table made. Change of height and inclination of top without lost motion.

Catalog on request.

Economy Drawing Table Company

Box No. 114

Adrian Michigan

Save Your Tree

Insects, worms and caterpillars can ruin trees in a season.

All worms and caterpillars are the young of insects—moths, etc. The females of many moths are wingless. They must climb the trunk to deposit eggs in the tree. Other species hatch in the ground and the larvae climb the trunk to feed on the leaves.

A protected tree trunk means absolute protection against Browntail, Tussock and Gypsy caterpillars, canker worms and many others, mitigating against tent caterpillars, codling moths, etc., etc.

INSECT-BAN

TREE TAPE

Absolutely bars all climbing pests

INSECT BAN is a tape in a protecting shield, saturated with a newly discovered powerful insect repellant. Cannot injure the tree. Harmless to birds or animals—but death to insects.

Shipped in rolls. User cuts to suit. Lasts whole season. Write for price, sample and booklet. Tells all about insects and worms, their habits, how to combat them, etc.

District managers and selling agents wanted

The Eggert Chemical Company

Canton, Ohio

ance which not only makes it effective in its mission, but is bound to create a favorable impression on visitors in the city, as it speaks of civic pride, as well as an interest in the safety and convenience of the public.

Drinking Fountains in Public Parks, Squares and Streets

In the majority of cities of the United States the matter of public drinking fountains has not been given the careful thought and investigation which are due to an issue which has

PURO SANITARY DRINKING FOUNTAIN IN COURT SQUARE, SPRINGFIELD, MASS.

such an important bearing on the public health. While the tin cup has long been condemned, many cities make use of so-called "sanitary" fountains which must be touched with the lips in drinking. And this, of course, was the chief argument against the tin cup.

The Puro Sanitary Drinking Fountain Company, 125 Main Street, Haydenville, Mass., has made an exhaustive study of public drinking fountain requirements, and has evolved a product which combines strict sanitation with efficiency and attractive appearance. The illustration shows one of these fountains installed in Court Square, Springfield, Mass. It is one of a large number in use in various parts of the city, and is greatly appreciated during the hot summer months. The cup is so designed that no contact with the metal is necessary to enjoy a full, deep drink. Consequently, the fountain is freely and unhesitatingly used by women and children. It might be stated in this connection that the Puro sanitary drinking fountain has been awarded gold medals whenever shown in safety and sanitary exhibits.

In addition to its sanitary advantages, the Puro fountain costs very little to maintain, and this commends it to the city or company that wishes to realize the maximum of service on its investments without the constant irritation of repairing and replacing broken or worn-out parts.

The fountains are adaptable not alone to public parks and squares, but also to use in public buildings and large manufacturing plants; and the company's engineers stand ready at any time to submit complete layouts for large or small installations.

The Secret of Lasting Concrete Floors

Experience has shown that concrete floors exposed to human and other traffic are subject to disintegration, resulting in uneven surfaces, and creating a dust nuisance that affects both machinery and merchandise. The hard silicate concrete dust also menaces the health of those who have to breathe it. More than this, the worn-out surface must be patched or re-topped at considerable expense.

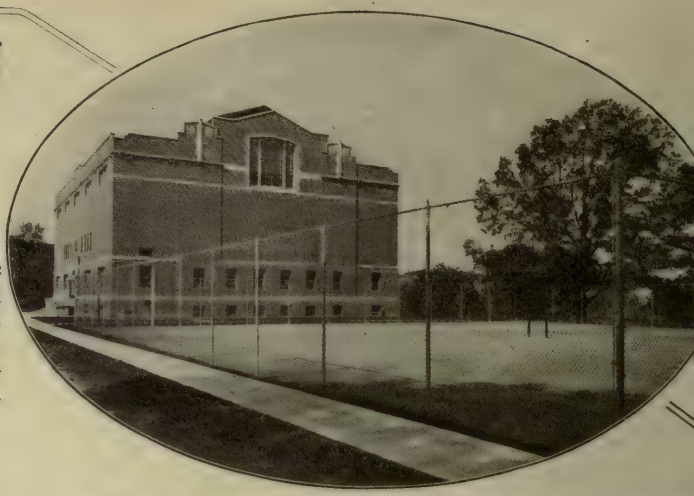
With these facts as a basis for investigation and experimentation, L. Sonneborn Sons, Inc., Department 27, 264 Pearl Street, New York City, after a long and thoro study of the whole problem, evolved a product which they call Lapidolith. This is a liquid chemical preparation which is applied to concrete floors as a wash. It penetrates the surface of the concrete, and closes the pores thru chemical action. Thru the Lapidolith application, a chemical reaction with the cement in the concrete takes place, and the result is a floor "as hard as granite." Floors finished by this method, it is claimed, will give the maximum of wear, and will resist disintegration for many years. In an interesting pamphlet issued by L. Sonneborn Sons are shown many views of large and well-known schools, factories and public buildings, the floors of which have been "Lapidolized." The Durham County Court House, Durham, N. C., which is shown on this page, has had its floors rendered dust-proof and wear-proof in this manner. Altogether, over 100,000,000

COURT HOUSE, DURHAM, N. C., THE FLOORS OF WHICH HAVE BEEN TREATED WITH LAPIDOLITH

square feet of concrete have been permanently treated with Lapidolith thus far, and the success of this floor coating warrants serious consideration by all who are confronted with the problem of preserving concrete floors and mitigating the dust nuisance.

PROTECTION for SCHOOL CHILDREN

The fence shown here gives absolute protection to the children yet does not shut off light and air. Gives a full view of the grounds from any point.



EXCELSIOR

CHAIN LINK FENCE

It has all the strength necessary to stand the hard knocks. Made of extra strong, large steel wires heavily galvanized to prevent rust. Imbed the posts in cement or concrete footings, and you have a fence that will stand up for many years. Made in various styles, heights and sizes of mesh.

EXCELSIOR CHAIN LINK FENCE is appropriate for industrial plants, storage yards, recreation grounds, playgrounds, parks, public enclosures of all kinds.

For beautifying public grounds, flower beds, etc., use Excelsior Rust Proof Flower Guards, Tree Guards, Arches Trellises. ***Write for Illustrated Catalog G***

WRIGHT WIRE CO. **Worcester, Mass.**

All Steel Playground Apparatus

THE EUREKA STUDEBAKER PARK COMBINATION

THE EUREKA LINE

Swings, Giant Strides, Flying and Traveling Rings, Teeter Boards and Ladders, Aluminum and Maple Slides, Park Settees and Lawn Swings, Merry-Go-Rounds, Horizontal Ladders and Combinations.

Cat. No. 16 Full Outfits And Fittings Only

The Ashland Mfg. Company
Dept. 14 Ashland, Ohio

To so form the life of our youth that they need never be reformed is indeed a great achievement

Eureka Equipment Utility Unexcelled Renowned Rectitude Efficient Economical Kiddies Kind All-Steel Apparatus

"Danger lies in the thought of a war 'over there'

"The plain truth is that the major part of the war must be carried on 'over here'

"A Chamber of Commerce * * * can do vast good—

in holding public opinion together

in becoming a focus of information for the Government and to the Government

in providing for the circulation of the large number of valuable official statements published by the Committee on Public Information

in representing the industrial and business community before the various war services

in keeping this department, among others, informed on matters that delay or injure the progress of war work in your community

in helping to adapt peace industries to war work

in brief, by becoming a focus for the industry and commerce of the community as both bear or may be made to bear upon the war

"Certainly this is the time when the business men of your city should pull together."

WILLIAM C. REDFIELD,
Secretary Department of Commerce.

This is the way one Cabinet member feels regarding the value of a vigorous, successful Chamber of Commerce to the Nation in its present emergency.

The quotation is from a letter Secretary Redfield wrote to an official of the Jersey City Chamber of Commerce. It is addressed, in spirit, to every official of every Chamber of Commerce in the Nation.

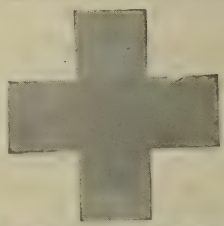
The need for strongly organized Chambers of Commerce in every city in the Nation was never so great as at present.

The services of The American City Bureau have been effective in bringing their full strength to over sixty vigorous, successful Chambers of Commerce. There is every reason why these services could be made equally valuable to your organization. Ask us to tell you more about them.

ORGANIZATION ACB SERVICE

The American City Bureau

Tribune Building **New York**



"A Great Net of Mercy Drawn Through an Ocean of Unspeakable Pain"

What Your Red Cross Dollars Do

An accounting of Expenditures of the First Red Cross War Fund

Every one of the twenty million and more Red Cross members is entitled to this statement. Your local Red Cross Chapter can give you further details.

First War Fund Appropriation up to March 1st, 1918

Foreign Relief:	
Relief in France	$30,936,103.04
Relief in Belgium	2,086,131.00
Relief in Russia	1,243,845.07
Relief in Roumania	2,676,368.76
Relief in Italy	3,588,826.00
Relief in Serbia	875,180.76
Relief in Great Britain	1,885,750.75
Relief in other Foreign Countries	3,576,300.00
Relief for Prisoners, etc.	343,304.00
Equipment and expenses in U. S. of Personnel for Europe	113,800.00
Total Foreign Relief	$47,325,609.38
Restricted as to use by Donor	2,520,409.57

United States Relief:	
U. S. Army Base Hospitals	$54,000.00
U. S. Navy Base Hospitals	32,000.00
U. S. Medical and Hospital Work	531,000.00
U. S. Sanitary Service	403,000.00
U. S. Camp Service	6,451,150.86
U. S. Miscellaneous	1,118,748.41
Total U. S. Relief	$8,589,899.27
Working capital for purchase of supplies for resale to Chapters or for shipment abroad	15,000,000.00
Working cash advances for France and United States	4,286,000.00
Total of War Fund Appropriations	$77,721,918.22

At the close of the first year of the War the Red Cross goes to the public for the riasing of the Second War Fund with a record of appropriations which warrants continued contribution to this great relief work. As an influential citizen of your community, join with your local Red Cross Chapter to make this campaign successful. Your Red Cross is the Army behind the Army. Give till your heart says stop.

Second Red Cross War Fund Week May 20-27

This space contributed to the Winning of the War by

THE GENERAL ELECTRIC CO., SCHENECTADY, N. Y.

through the Division of Advertising, U. S. Government Committee on Public Information

BENCHES
AND
SWINGS

for

Parks and Playgrounds

**MADE IN ALL GRADES,
STYLES AND SIZES**

Write for Illustrated Material

NOLL BROTHERS, MFRS.

Bausman, Lancaster Co. :: Penn.

Cemcoat

The Enamel-like Wall Coating

Cemcoat is furnished in either Gloss or Flat.
Cemcoat has the combined virtues of enamel and paint.
It presents a tile-like finish.
It is washable, sanitary and durable.
Cemcoat should be used for all municipal buildings such as Schools, Bath Houses, Police Stations, Jails, etc.
Particularly adapted for safety lines on pavements.

Write for literature, color card, testimonials, etc.

Department 27

L. SONNEBORN SONS, Inc.
264 Pearl Street, New York

SANITARY DRINKING FOUNTAINS

LIPS CANNOT TOUCH IT
WASTE WATER FROM MOUTH CANNOT RETURN TO THE BUBBLER
Ideal for Parks and Schools
Write for free Booklet
PURO SANITARY DRINKING FOUNTAIN CO.
125 Main St., Haydenville, Mass.

FOUNTAINS
DISPLAY and DRINKING
LAMP STANDARDS
OVER ONE THOUSAND PATTERNS
THE CASEY HEDGES CO.
CHATTANOOGA, TENN.
Chicago **Cincinnati**

LAPIDOLITH
TRADE MARK

For All Concrete Floors

The concrete floors in your water-works, fire-houses, filtration plants, pump stations, etc. need Lapidolith to make them hard as granite—dustproof, waterproof and resistant to the action of mostc hemicals. Lapidolith should be used on all concrete floors, old or new. Results are guaranteed.

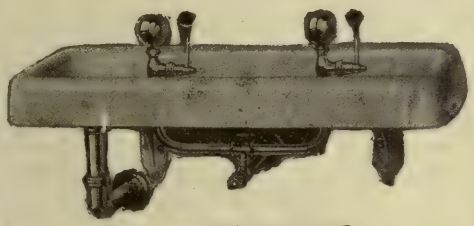
Used by leading industrial plants in every line in every city.

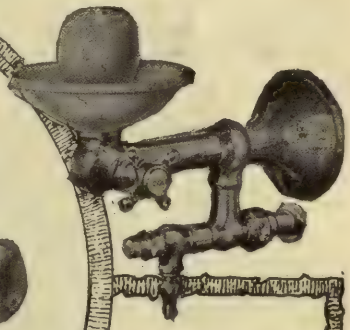
Write for literature, testimonials and free samples.

Department 27

L. SONNEBORN SONS, Inc.
264 Pearl Street, New York

For Your Schools





Sanitary Drinking Fountains
The kind that does away with the disease-breeding cup. The Rundle-Spence bubbling fountains shoot a clear, cool stream of water to your mouth.
Made for Schools, Libraries and all public buildings.

Beautiful ornamental fountains for parks, streets and boulevards.
Low installation cost and practically no maintenance expense are two more attractive features.

Write for interesting illustrated booklet showing hundreds of designs.
RUNDLE-SPENCE MFG. CO.
Milwaukee, Wis.

REFUSE GOES INTO THE CAN— NOT INTO THE STREET

Why doesn't your city place Rochester cans on the street corners, in the parks and in all other convenient places. Rochester cans do away with unsightly littered streets. All rubbish goes into the cans — not into the gutters.

Made of the best materials and in many styles. Made by the makers of the famous "Iron Horse Brand" ash, garbage, street and trash cans.

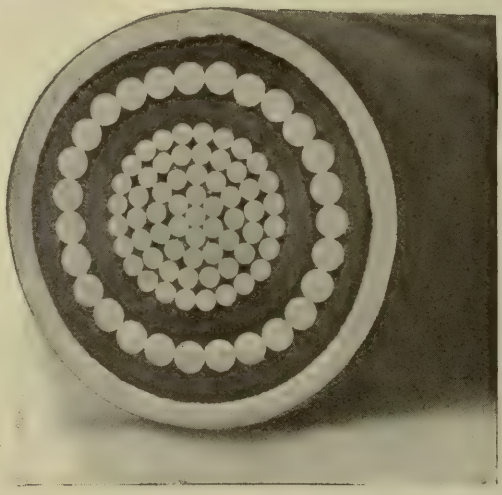
Reasonable prices. Immediate shipments.

Send for illustrated catalog.

ROCHESTER CAN CO.

ROCHESTER, N. Y.

SIMPLEX WIRES AND CABLES



INSULATED WITH

RUBBER, CAMBRIC OR PAPER

SIMPLEX WIRE & CABLE CO

MANUFACTURERS

201 DEVONSHIRE ST. BOSTON

CHICAGO SAN FRANCISCO

After the War

HAT is your business going to be after the war—an institution or a memory? Are you grooming yourself for second place—for oblivion—or for leadership? u may have anything you want—but you must decide *now*. You cannot wait until ce is declared and then decide. What you do with, to and for your business *dur-* the war is going to determine just where you'll stand *after* the war.

You cannot eat your cake and have it too. You cannot hide your head in the d until the storm is over and then make the public believe that you are one of the ntry's big, bold captains of industry. Did you think that you could *embalm* your iness for the period of the war and then resuscitate it at will? It can't be done.

This country isn't going out of business!

J. Pierpont Morgan, the elder, made all of his money "by always being a bull on United States!" No matter what else went up or down he always played the United tes for a rise. Don't you think he would play the game the same way today— l don't you think he would win bigger than ever?

The country's going ahead just the same—with or without you—but don't you h, just for your own sake, that you had a little more of that Morgan faith and opti- m and the courage they breed?

If your business is built on *publicity*—on the public's knowledge of you and its d-will toward you—are you going to keep that knowledge alive and that good-will ive—or not?

Suppose you can't fill your orders now—suppose your facilities are all taken up h war work—or you can't get enough cars to ship in—or the public isn't buying ır goods just now—or any one of a thousand things—are you going to invite the blic to forget you?

The public has a short memory. Are you willing to risk its forgetfulness—even invite it? Figure it out in dollars and cents. *Can you afford it?*

The calmest judges of affairs in the country prophesy a post-war period of pros- ity for America such as the world has never seen! And every man who thinks knows t it is true. The figures of after-the-war trade are going to stagger even the optimists. *world* is to be rebuilt, re-clothed, re-furnished and re-stocked—entertained, amused l educated all over again. The institutions that build their places in the public d-will *now* are going to do the job—at enormous profit and satisfaction to every- dy concerned.

Businesses that are firmly intrenched in the public *mind* and the public *good-will* en the war ends are going to make fortunes while the others are getting started! urs will not be one of them unless you lay th foundation *now*. THE AMERICAN CITY going through the war with *full steam up* and invites all good advertisers to go along.

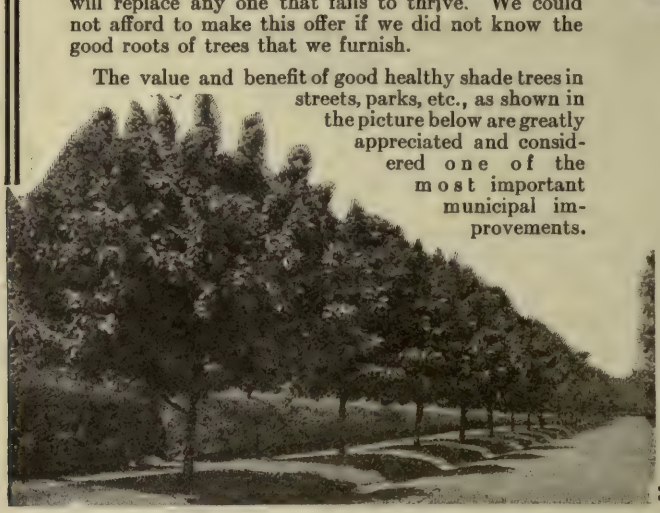
The above material was prepared by W. M. Hart of the Photoplay Magazine, thru whose courtesy we are adapting it as an advertisement for THE AMERICAN CITY.

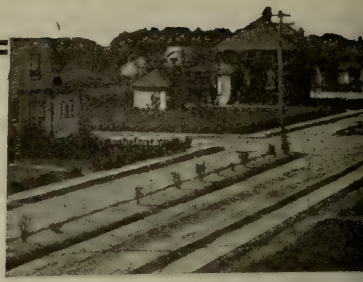
Shade Delivered With The Trees

3 to 5 years or more according to size saved over small saplings. We take the risk during their early tender life and you get the benefit.

We guarantee good trees of substantial growth and will replace any one that fails to thrive. We could not afford to make this offer if we did not know the good roots of trees that we furnish.

The value and benefit of good healthy shade trees in streets, parks, etc., as shown in the picture below are greatly appreciated and considered one of the most important municipal improvements.





Don't leave your streets barre and uninviting like the abov With a small outlay of mone make your city attractive and desirable place to live in.

Write today for literature on th subject.

Remember Hick's Trees ar tall, straight and bushy and ou 65 years in the business is a guar antee of quality.

HICKS NURSERIES

Westbury Long Islan

"The Spring's the Thing"

SHAWNEE MOWER CO., 5 Beekman St, N. Y.

Butler Refuse Cans

are neat cans

The collected refuse in Butler Cans doesn't show up before your eyes.

It is covered from view (see illustration). These cans are shipped "knock-down" thus saving big freight bills. Write for particulars.

The Butler Mfg. Co.
St. Anthony Falls Sta.
Minneapolis, Minn.

Also makers of "Rus-Pruf" corrugated culverts with B.M.C. Wings

STEWART IRON FENCE

"The Standard of the World"

beautifies and protects public proper economically, permanently, satisfactori The fencing of reservoirs at Chattanooga, Ten Fort Thomas, Ky., Butte, Mont., and pumpi stations at New York City and Seattle, Wash., typical Stewart installations.

Stewart's Iron Fence and Gates for hospitals, schoo parks, playgrounds and public buildings. Wr for big illustrated catalog.

THE STEWART IRON WORKS CO
(Incorporated)

527 Stewart Block Cincinnati,

Thorburn's

1917 Catalog

A very large volume of Thorburn Seeds
e furnished for parks and cemeteries.

Write us for catalog and let us know your
quirements: and your letter will have our
ompt and careful attention.

J. M. Thorburn & Co.
Barclay Street NEW YORK

MEEHAN
Nursery Stock
Needs no recommendation. It is known throughout the American Continent

225 acres

ORNAMENTAL TREES, SHRUBS, EVERGREENS and HARDY PLANTS

Spring catalog now ready

THOMAS B. MEEHAN CO.
Wholesale Nurseryman
DRESHER (Near Philadelphia) PA.

Burpee's Seeds Grow

URPEE'S ANNUAL for 1918, the Leading American Seed Catalog contains the latest and most reliable formation about "The Best Seeds that Grow." 216 pages with 103 colored illustrations. It is sent e to those who write for it. Write for your copy today. A post card will do.

V. ATLEE BURPEE & CO. Seed Growers PHILADELPHIA

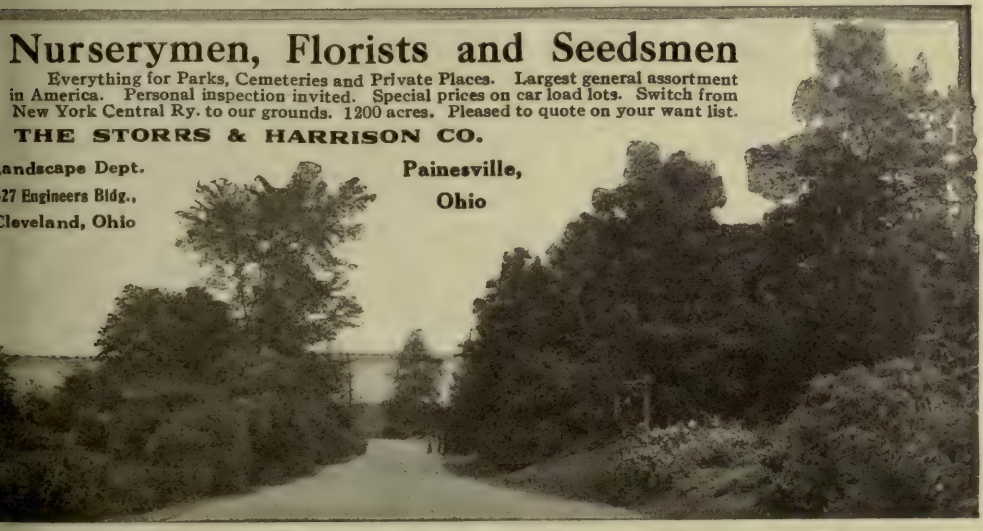
Nurserymen, Florists and Seedsmen

Everything for Parks, Cemeteries and Private Places. Largest general assortment in America. Personal inspection invited. Special prices on car load lots. Switch from New York Central Ry. to our grounds. 1200 acres. Pleased to quote on your want list.

THE STORRS & HARRISON CO.

Landscape Dept.
27 Engineers Bldg.,
Cleveland, Ohio

Painesville,
Ohio



NORWAY MAPLES

The best shade tree for street and park purposes — especially in northern latitudes and in smoky and dusty localities — is the Norway Maple.

Norway Maples such as the one depicted transplant with the minimum of setback and give immediate effect. We have several thousand trees just as good as this one. Many are better.

All are sound, healthy trees with straight, smooth, sturdy trunks, heavy masses of fibrous roots, and well-developed, bushy heads. They run 14 to 16 feet tall and in two calipers — 2 to 2½ inches and 2½ to 3 inches.

Trees of this size pack about 500 to 700 to the carload. Write us for prices on the quantity you can use. Special prices on carload lots.

We also grow a general line of trees, shrubs and evergreens for street and park planting.

Framingham Nurseries
FRAMINGHAM — MASSACHUSETTS

Willadean Nurseries

Offer a very complete line of Trees, Shrubs and Ornamental stock for all kinds of Landscape work. Send your want lists for estimate. Trade list on application.

THE DONALDSON CO.
Box 22, SPARTA, KY.

TREES SHRUBS EVERGREENS

800 ACRES

AMERICAN NURSERY CO.
Singer Building, New York
NURSERIES
Springfield, N. J. Flushing, L. I.

BOBBINK & ATKINS

World's Choicest Nursery and Greenhouse Products

We invite interested parties to visit our Nursery and inspect our Trees, Shrubs, Evergreens, Herbaceous Plants, Roses and other stock of which we have more than 300 acres.

OUR ILLUSTRATED GENERAL CATALOG No. 22 describes the high class Nursery material we grow.

SPECIAL PRICES quoted on lists for Public Parks.

Nurserymen, Florists and Planters, Rutherford, New Jersey

W. & T. SMITH COMPANY

NURSERY STOCK AT WHOLESALE

Send for Catalogue and Price List

GENEVA NURSERY, Geneva, N. Y.

Lewis & Valentine Co.
Roslyn, N. Y.
The World's Largest Movers of Big Trees.

Ornamental Trees, Shrubs, and Hardy Perennials

A complete stock.
Quality unexcelled.
Send for price list.

HENRY KOHANKIE & SON
Painesville, Ohio

Norway Maples

are unrivalled for shade and for landscape effects. We have a large stock of splendid specimens that will mature rapidly into towering round-topped trees, with clean, sturdy trunks. Also a complete stock of ornamentals. Over 2500 acres in nursery stock.

Write for 1918 Catalog and prices.

Harrisons' Nurseries, BOX 70, Berlin, Md.

AMERICAN-GROWN TREES

OUR stocks of trees, shrubs and plants are not curtailed by the stoppage of foreign shipments. We sell Andorra-grown.

Catalog on request.

ANDORRA NURSERIES
Wm. Warner Harper, Prop.
Box 20, Chestnut Hill, Phila., Penna.

FOR *SAFE* TREE SURGERY—

for Tree Surgery that is scientifically accurate and mechanically perfect—for Tree Surgery that saves trees without guessing and experimenting—come to headquarters.

The Davey Tree Expert Co., Elm St., Kent, Ohio

Branch offices with telephone connections: 225 Fifth Ave., New York. 2017 Land Title Bldg., Philadelphia. 450 McCormick Bldg., Chicago.

Permanent representatives in all principal cities.

Davey Tree Surgeons

ENTERPRISE PROTECTIVE FENCE

protects and beautifies

Keeps out undesirable persons. Beautifies surroundings and increases values. Does not obstruct fine views.

Schools, Hospitals, Parks, Estates, Public Bldgs., Cemeteries, Asylums, Etc., Etc.

Send for Illustrated Catalog explaining offer to make free blue-print of Enterprise fencing for any property.

ENTERPRISE IRON WORKS 1161 E. 24th St., Indianapolis

Specialists for 33 years in All-Iron and Iron-and-Woven-Wire protective fencing

Lawn Beauty with Economy and Conservation of Labor

Under ordinary conditions, hand mowing is inefficient and expensive. This year, with labor at a premium and almost impossible to obtain, hand mowing is prohibitive.
The solution to the lawn cutting problem is the

FULLER & JOHNSON
MOTOR LAWN MOWER

The Fuller & Johnson Mower combines the convenience of a hand mower with large cutting capacity. In one day's time one man can cut five acres of lawn with the Fuller & Johnson. He can cut it so perfectly that no after-trimming around trees, shrubs or driveways will be necessary. He can cut it when needed instead of waiting, as with a horse mower, until the turf is solid so that the lawn won't be marred by the horse's hoofs.
This is what the Superintendent of the Park District of Oak Park, Ill., has to say about the Fuller & Johnson:

> "Replying to your inquiry of July 5th, we are glad to say that the Fuller & Johnson Motor Lawn Mower which we purchased from you a few months ago has been in constant use, has required very little repairs and has been in every way very satisfactory, so much so that were we in the market for another machine of this type, I am sure we would not hesitate to purchase another of this kind."

All over the country, in parks, cemeteries and on large estates, Fuller & Johnson Motor Lawn Mowers are fast replacing hand mowers, horse mowers and the heavier types of motor mowers. Where you find the most beautifully kept lawns there too you will find the Fuller & Johnson Mowers, for good business judgment as well as lawn beauty dictate their use. Let us send you complete details about the Fuller & Johnson. Write for a copy of our new book entitled "A Better Lawn."

MANUFACTURERS DISTRIBUTING CO.
472 Fullerton Building St. Louis, Mo.

DREER'S GRASS SEEDS

¶ You sow a seed that is full of life and vigor when you sow

DREER'S GRASS SEED

¶ Special brands for every purpose—sunny or shady places, lawns, terraces; for city, park and seashore use. All brands composed of choicest, re-cleaned seed, carefully blended, and tested for germination.

¶ Write for prices or any desired information on lawn making. Special Grass Seed Circular—free.

DREER'S GARDEN BOOK FOR 1918 contains much information helpful to those interested in civic improvements which include flowers, shrubbery, etc. Sent free to anyone mentioning this publication.

HENRY A. DREER
714-716 Chestnut St. Philadelphia

GET BOOK "D"
THE FIBRE CONDUIT COMPANY
New York Boston Chicago San Francisco

REILLY'S IMPROVED PERMANENT PATENTED CREOSOTE OIL

FOR WOOD PAVING BLOCKS—More than ⅓ of all the wood block pavements in America are preserved with our oils. The Reilly name means highest quality and lasting satisfaction. See that your contract specifies Reilly's Improved Creosote Oil.

Republic Creosoting Co., Indianapolis, Ind.

DIRECTORY OF CONSULTING ENGINEERS CONTRACTORS LANDSCAPE ARCHITECTS

Expert dvice is a Real conomy

Effective Construction Requires Wise Planning

bright & Mebus
CIVIL ENGINEERS
ve planning and municipal improve-, parks, drainage, sewerage and e disposal.
08 LAND TITLE BUILDING
PHILADELPHIA

KANSAS CITY, MO. Interstate Bldg.
Burns & McDonnell
CONSULTING ENGINEERS
Appraisals, Rate Investigations, Expert Testimony, Water Works, Sewerage, Lighting.
Clinton S. Burns R. E. McDonnell

F. A. Dunham-Clarin Co.
CIVIL ENGINEERS
Municipal Engineering
Roads Sewers Supervision
Surveys
Topographic Title
Land Subdivisions
109 Park Ave. Tel. 610
PLAINFIELD, N. J.

ALLENTOWN
STING LABORATORY
specting and Testing Engineers and Chemists.
ment and Aggregates, Steel, Paving Materials, Water Analyses
EST B. McCREADY, Director
373-77 Linden St., Allentown, Pa.

JAMES M. CAIRD
Assoc. Am. Soc. C. E.
CHEMIST and BACTERIOLOGIST
OFFICE AND LABORATORY
271 RIVER STREET TROY, N. Y.
Water Analysis and Tests of Filter Plants

Analyses Tests Inspections
Consultations Reports Specifications
WALTER H. FLOOD
Chemical Engineer
PAVING AND ENGINEERING MATERIALS
Municipal Work a Specialty
326 River Street, CHICAGO

---

hn W. Alvord and Chas. B. Burdick
ONSULTING ENGINEERS
ports, Investigations, Plans and ifications for Water Supplies, or Purification, Water Power, rage, Sewage Disposal.
TFORD BLDG. CHICAGO

CHESTER & FLEMING
HYDRAULIC AND SANITARY ENGINEERS
Water Works, Water Filtration, Appraisements and Reports, Sewerage, Sewage Disposal, Operation of Properties.
UNION BANK BLDG. Pittsburgh

Fuller & McClintock
CONSULTING HYDRAULIC ENGINEERS and SANITARY EXPERTS
170 Broadway, New York City
George W. Fuller James R. McClintock
Jesse K. Giesey

EFFIELD A. ARNOLD
Landscape Architect
Land Subdivisions
Parks Institution Grounds
Private Estates
Bromfield St. Boston, Mass.

LOUIS S. COLE
LANDSCAPE ARCHITECT
14 E. Jackson Blvd.
CHICAGO, ILL.
Specialist in City Planning, Playgrounds, Parks and Cemeteries.

Gannett, Seelye & Fleming
CONSULTING ENGINEERS
Civil, Hydraulic, Sanitary, Electrical, Municipal Problems
204 LOCUST ST., HARRISBURG, PA.

RNOLD & TRIPP
Landscape Architects
Planning, Land Subdivisions, Parks, Institution Grounds, Private Estates
rdian Bldg., Cleveland, Ohio

J. R. CRAVATH
Consulting Engineer
140 S. Dearborn St., Chicago
Street lighting.
Public utility rates and valuations.
Supervision of operation of electric plants.

SAMUEL A. GREELEY
64 W. Randolph St., Chicago
Hydraulic and Sanitary Engineer
Sewerage, Sewage Disposal, Water Supply and Filtration, Garbage and Refuse Disposal, Treatment of Industrial Waste, Supervision of Operation.

---

sas City, Mo. Interstate Bldg.
LACK & VEATCH
Consulting Engineers
rage, Sewage Disposal, Water Sup-Water Purification, Electric Lighting, er Plants, Valuations, Special Investi-ns and Reports.

WILLIAM E. CULLEN
Landscape Architect and Designer
Ornamental Gardening, Beautifying Homes, Rural Districts, Towns, Schools, Yards, Parks and Cemeteries.
BOULDER, COLORADO

JOHN H. GREGORY
Consulting Hydraulic Engineer and Sanitary Expert
170 Broadway, New York City
Reports, Investigations, Plans and Specifications for Sewerage, Sewage Disposal, Water Supply, Water Purification and Garbage and Refuse Disposal.

H. BLANCHARD
Am. Soc. C. E. M. Can. Soc. C. E.
CONSULTING HIGHWAY ENGINEER
ROADWAY and 117th STREET
NEW YORK CITY

The Duluth Engineering Co.
W. B. PATTON, Mem. Am. Soc. C. E., Ex-City Engineer Duluth, Manager
MUNICIPAL ENGINEERS
Waterworks, Sewerage, Electric Lighting, Town Planning.
Suite 612-616 Palladio Building
DULUTH, MINN.

New York City 2 Rector Street
A. E. HANSEN
Hydraulic & Sanitary Engineer
Design & Supervision of Construction
Sewerage Water Works
Sewage Disposal Water Purification
Drainage Water Works Valuation
Garbage Disposal Water Analyses

James C. Harding,
Consulting Engineer and Sanitary Expert.
Water Supply and Purification. Refuse Disposal. Sewerage and Sewage Disposal. Investigations of Epidemics. Water Works Valuations. Supervision of Construction and Operation.
New York City, 170 Broadway

MUNICIPAL PROBLEMS
Budget Making—Salary Standardisation—Centralized Purchasing—Cost Accounting—Public Utility Service and Rate Studies
J. L. JACOBS & COMPANY
Engineers—Cost Accountants—Municipal Experts
Monadnock Building Chicago

HUGH C. MITCHELL
GEODETIC ENGINEER
CONSULTANT ON CITY TRIANGULAT
PRECISE LEVELS, AND TOPOGRA
SURVEYS.
601 West 32d Street
AUSTIN, TEXAS

Sid. J. Hare, Fellow A.S.L.A. — S. Herbert Hare, Member A.S.L.A.
HARE & HARE
Landscape Architects
604 Gumbel Bld., Kansas City, Mo.
Plans and Reports for Parks, Park Systems, Land Subdivisions, Estates, Municipal Improvements, Cemeteries

The
JENNINGS-LAWRENCE CO.
CIVIL AND MUNICIPAL ENGINEERS
511-12 Hartman Bldg.
COLUMBUS OHIO

FRANK H. NUTTER
Landscape Architect and Enginee
710 Sykes Block, Minneapolis, M
Advice, Sketches, Designs or full W ing Plans for Parks, Cemeteries, P or Home Grounds Surveys mad desired. Correspondence Solicited
City Park Engineer from 1883 to 1

HAZEN, WHIPPLE & FULLER
CONSULTING HYDRAULIC and SANITARY ENGINEERS
WATER SUPPLY and SEWERAGE
Allen Hazen, W. E. Fuller, C. M. Everett, G. C. Whipple, F. F. Longley, L. N. Babbitt, H. Malcolm Pirnie
30 East 42d St. NEW YORK CITY

GEORGE A. JOHNSON
M. Am. Soc. C.E.
Consulting Hydraulic Engineer and Sanitary Expert
150 Nassau St., New York.
Water Supply and Purification. Sewerage and Sewage Disposal. Plans and Reports. Supervision of Construction. Valuations. Improved Operation of Existing Plants. Investigation of Epidemics.

POLLOCK AND TAB
CONSULTING ENGINEERS
Pavements, Highways, Water Sup Drainage, Sewerage and Sewage Dis
Designs, Specifications and Supervis
Clarence D. Pollock, George A. Taber — Member Am. Soc. C
Park Row Building, New York

Arthur H. Helder
Landscape Architect
413 Reliance Bldg. Kansas City, Mo.

A. Elliott Kimberly
SANITARY ENGINEER
Water Supply, Water Purification, Sewerage, Sewage Treatment, Industrial Waste Disposal
8 East Long St. COLUMBUS, OHIO

Alexander Potter, C.
Hydraulics, Sanitation, C crete Structures Designed Executed.
50 Church Street, New Yo
(Hudson Terminal) Tel., Cortlandt

Rudolph Hering, D.Sc.
Consulting Engineer
170 Broadway New York
WATER SUPPLY, SEWAGE AND REFUSE DISPOSAL
Over 40 years active practice in United States and Canada

MORRIS KNOWLES
Consulting, Sanitary and Hydraulic Engineer
Municipal, Community and Civic Problems
Pittsburgh, Penna.

Clyde Potts
50 CHURCH ST. NEW YO
Civil and Sanitary Engineer
Sewerage and Sewage Disposal Wo Hydraulics, Water Works, Filtrat Reports, Plans and Estimates.

J. Wallace Higgins
Assoc. M. Am. Soc. C. E.
CIVIL AND LANDSCAPE ENGINEER
Municipal Engineering, Sewerage, Parks, Cemeteries, Subdivisions, Topographic Surveys, Title Surveys, Estimates, Supervision
52 Vanderbilt Avenue, New York

CHARLES W. LEAVITT
CITY PLANNING
and all branches of
CIVIL and LANDSCAPE ENGINEERING
220 Broadway NEW YORK

VICTOR A. RIGAUMONT
CITY PLANNER
Ferguson Bldg., Pittsburgh, Penn
INDUSTRIAL HOUSING
MUNICIPAL BUILDINGS
PARKS AND PLAYGROUND
Thoroughfares—Transportation

Charles C. Hopkins
M. Am. Soc. C. E.
Consulting Hydraulic and Sanitary Engineer
349 Cutler Bldg., Rochester, N.Y.
Water supply and purification. Sewerage. Sewage and wastes disposal. Municipal engineering. Plans, reports, estimates, supervision. Expert testimony and appraisals.

J. L. LUDLOW
Winston-Salem, N. C.
Consulting Municipal Engineer Sanitary and C ic Expert
Water Supplies, Sewage Disposal, Reports, Plans, Valuations, Appraisals. Efficiency and Economy Studies, Physical and Financial Reports on Public Utilities in Southern Cities. Advice in Municipal Sanitation and Public Health. Interviews by appointment in Eastern Cities.

LOUIS E. STANDE
Certified Public Accountant
Municipal and Public Utility Accoun Rate and Capitalization Cases
200 Fifth Avenue, New Yo
Chief Acct.—Bd. of Ed. 1899-190
Acct—Pub. Service Com. 1908-191
Chief Auditor—Dept. Water Supply, and Electricity, 1912-1916.

LANDSCAPE DESIGN
Development of Parks, Cemeteries and Institution Grounds
Private Estates and Sub-divisions
M. H. HORVATH
Landscape Architect & Consulting Forester
649 Leader-News Building
Cleveland, Ohio

THOMAS MEEHAN & SONS
Practical Landscape Gardeners and Engineers
Especially qualified for work involving use of hardy plants. Large estate developments: country clubs. Plans executed.
"We know plants"
6703 Chew Street, Germantown, Phila., Pa.

Sewage Disposal Plan
for Country Residences, Factories and I tutions. Standard Plans and Specificat including description and estimate of of modern sewage treatment.
Blue Prints, 12 sheets, 9" x 12", $5.00
LeRoy K. Sherman, Sanitary Engi 1102 Tacoma Bldg., Chicago.

Henry W. Taylor
YDRAULIC AND SANITARY ENGINEER
Cortlandt St., New York
100 State Street, Albany, N.Y.
ater Supply, Water Purification, Sewer-e, Sewage Disposal, Reports, Plans, Su-rvision of Construction and Maintenance

Waddell & Son
Consulting Engineers
Movable Bridges, Reinforced Concrete and Steel Structures, Elevated Railways, Reports, Checking of Plans, Advisory Services and Appraisal.
Main Office, Kansas City.
New York Office, 35 Nassau Street.

Washtenaw Engineering Company
ANN ARBOR, MICH.
Water Supply; Sewerage and Sewage Disposal; Refuse Disposal; Roads and Pavements; Highway Bridges and Culverts; Drainage; Land Surveying, Subdividing, and Platting; Municipal Accounts and Systems; Municipal Street Lighting.

. SCOTT TWOGOOD
ivil and Sanitary Engineer
14-15 Bank of Commerce and Trust Bldg.
MEMPHIS, TENN.
ater Supply, Water Purification, Sewerage ystems, Sewage Disposal, Reinforced Con-ete Structures, Municipal Improvements, eration of Purification Plants, Laboratory for Analysis of Water and Sewage.

WARREN ENGINEERING CO.
Specializing in Municipal Water Supply and Purification, Sewerage and Sewerage Disposal, Paving.
DECATUR ILLINOIS

MARK WOLFF
Certified Public Accountant
Consultant
Rate & Capitalization Cases
Gas, Electric & Water Utilities
1328 Broadway
New York City
Municipal Accounting

Robert W. Hunt Jno. J. Cone Jas. C. Hallsted D. W. McNaugher
ROBERT W. HUNT & CO., GENERAL OFFICES: 2000-175 W. Jackson Blvd., Chicago, Ill.
ENGINEERS, INSPECTORS, CHEMISTS
Inspection Steel and Cement for Buildings and Bridges, Paving Materials, Cast Iron Pipe. Inspectors Permanently at Points of Manufacture.

SCOFIELD ENGINEERING COMPANY, PHILADELPHIA
Consulting Engineers
An organization of thoroughly trained experts with a wide successful experience in
PUBLIC SERVICE PROPERTIES, INDUSTRIAL AND TEXTILE PLANTS, REFRIGERATION, MUNICIPAL IMPROVEMENTS

WAR ACCENTUATES CITY WASTE PROBLEMS

Conservation and economy are supplanting loose methods and wastefulness in all municipal activities.

No field offers greater opportunity for wartime economy and efficiency than the collection and removal of municipal wastes—ashes, sewage, garbage, rubbish and street refuse.

To eliminate guesswork and assist both the citizen and the city official in the solution of these problems

MUNICIPAL HOUSECLEANING
By William Parr Capes

Embraces in a small compass a fund of authoritative information about waste problems which the author has collected as Director of the New York State Bureau of Municipal Information.

Price, $3.00 Net. Postage Extra. All Bookstores
E. P. DUTTON & CO., 681 Fifth Ave., N.Y.

We Can Do The Same For You!

We are Consulting Engineers for Municipalities.
We designed, built and operated the Cleveland Municipal plant. Its maximum rate is 3 cents per K. W. hour.
We represent cities in negotiations with the Utility Corporations.
We prepare valuations and represent cities before the State Commissions in rate cases for Electric Light, Gas, Telephone, Water Works and Railway Fare Cases.

Write for Printed Matter

F. W. BALLARD & CO.
Engineers
Swetland Building Cleveland, Ohio

DU PONT AMERICAN INDUSTRIES

Highways Feed Railways

Mark X before subject that interests yon and **Mail This Coupon** to

E. I. Du Pont De Nemours & Co.
Advertising Division
Wilmington A. C. Delaware

- [ ] Industrial Explosives
- [ ] Blasting Powder
- [ ] Blasting Supplies
- [ ] Py-ra-lin Toilet Goods
- [ ] Challenge Collars
- [ ] Ry. & Marine Paints
- [ ] Motor Fabrikoid
- [ ] Craftsman Fabrikoid
- [ ] Alums
- [ ] Trapshooting
- [ ] Commercial Acids
- [ ] Bronze Powder

Name.....

Address.....

City.....

State.....

Never before have our roads been so important. The tremendous tonnage of freight and express required for national work has turned all main roads into freight lines and side roads into feeders. Heavy motor truck traffic demands better roads. Don't let them deteriorate.

DU PONT

Red Cross Dynamite

is a powerful first aid in road construction, improvement and maintenance. It replaces much labor of men, teams and machinery and reduces cost in cutting grades, eliminating projecting hillsides, straightening streams, and cleaning right of way.

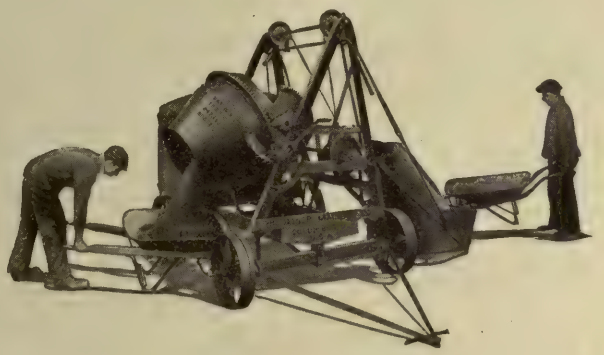
Check Industrial Explosives in the coupon and write in the margin "Road Work". We will send full information including our big illustrated book on road construction and maintenance by all modern methods.

E. I. Du Pont De Nemours & Co.

Established 1802

Wilmington **Delaware**

DU PONT



Jaeger Concrete Mixer

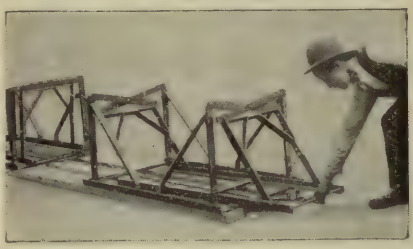
Used by progressive municipalities and contractors.

Especialy adapted to "speed-up" work.

Write us for detailed information.

The Jaeger Machine Co.

215 W. Rich Street - - Columbus, O.



ADJUSTABLE

For Thirty-nine Different Sized Openings and will build any length culvert.

THE ONE MAN COLLAPSIBLE CULVERT FORM

Will Cut Culvert Costs Tremendously

Supplied in Sections each 4 feet long

Booklet sent on request.

Storms Mfg. Co.

347 Monadnock Block Chicago, Ill.

Littleford Tar Heaters

Many municipalities have found the **"Littleford"** a valuable and economical asset in Street Repair work.

Write for booklet.

LITTLEFORD BROS. 500 E. Pearl St., Cincinnati

BUFF

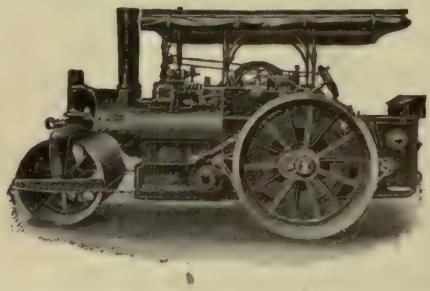
ENGINEERING INSTRUMENTS

are the strongest, most accurate and longest-lived Instruments built. The close accuracy, high grade materials and superior workmanship have made the Buff the recognized standard. *Write for catalog No. 4.*

BUFF & BUFF MFG. CO. Jamaica Plains, BOSTON, MASS.

221 Lamartine Street 231 N. Wells Street, Chicago, Ill.

QUALITY MACHINERY



BUFFALO PITTS ROLLERS

Are purchased by discriminating buyers because of the many years of satisfactory service which they will render, the low repair costs and their general reliability.

ASK THOSE WHO OWN THEM

All sizes All Types Write for catalogue

Built only by

THE BUFFALO-SPRINGFIELD ROLLER COMPANY

SPRINGFIELD, OHIO

MOTOR TRUCK AND HORSE DRAWN

FLUSHERS—SPRINKLERS—OILERS

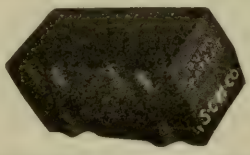
Also Flushing, Sprinkling and Oiling Units complete for mounting on trucks

E. D. ETNYRE & CO. : OREGON, ILL.

SOUTHERN CLAY MFG. CO.

James Building

CHATTANOOGA, TENN.



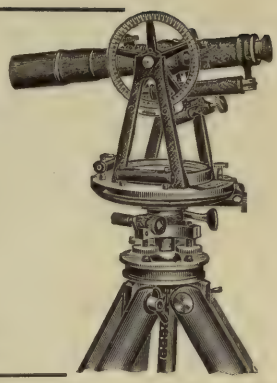
Annual Capacity: Thirty Million Paving Blocks

Manufacturers of

WIRE-CUT-LUG BLOCKS

DUNN PATENT

KOLESCH SURVEYING INSTRUMENTS



are sturdy, accurate and moderate in price

Municipal Engineers Are Invited

to send for a Kolesch Transit or Level to try out, without obligation to purchase, unless entirely satisfactory.

Engineering Instruments and Supplies

TRADE MARK

KOLESCH & CO., 138 Fulton Street, New York

ODORLESS STAINLESS

DUSTOLINE FOR ROADS

TRACKLESS (TRADE MARK) TRANSPARENT

THE DUSTOLINE FOR ROADS CO., Summit, N. J., Phone 33

Has none of the objectionable features of the black asphaltic oils or tar preparations

"PIONEER" Highest Quality ASPHALTS

"High Quality Materials for High Quality Work"

Bituminous Materials for every purpose

THE PIONEER ASPHALT CO.

7325 Woodlawn Ave., Chicago, Ill.

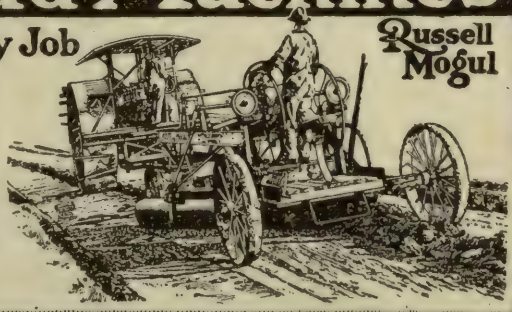
LYNCHBURG FOUNDRY COMPANY

Bell and Spigot and Flanged

GENERAL SALES OFFICE: Peoples Gas Building, CHICAGO, ILL.

Russell Road Machines

A Size and Type For Any Job



All sizes Road Machines, Elevating Graders, Scarifiers, Dump Wagons, Spreader Wagons, Planers, Culverts, Steel Beam Bridges, etc.

RUSSELL "MOGUL" 7000 lbs., 12 Ft. Blade

This big machine's strength cannot be overtaxed by the largest tractor. Operating adjustment simplified, yet so complete that you will be surprised at the ease and perfection with which big work is done. Free trial offered.

Big Catalog and Road Fact Book--FREE

RUSSELL GRADER MFG. CO., Minneapolis, Minn.

Representatives in All Principal Cities.

UNIFORMITY

is a prime requisite of WARRENITE—The Country Road Surface, and is safeguarded by systematic testing to insure the highest standard possible in the mixture of

WARRENITE Road Surface

These tests are made by expert chemists of real authority.

Now in time of war county officials should not spend money experimenting—their efforts should be directed toward a standard surfacing which has already stood the test as to motor transportation and varying climatic conditions as has

WARRENITE

Trunk line highways are necessary to relieve the overburdened railroads of the freight congestion.

Highways should be encouraged and built at once. Never were they more needed than at the present time

BUT

these highways should be built of a material which will give you a well paved highway for years to come.

Insist on
WARRENITE
The Ideal Country Road Surface
All to gain—Nothing to Lose

Write today for WARRENITE circulars, specifications, and form of mixture agreement available to all contractors and learn more about this modern ideal country road surface. **It is to your advantage.**

Warrenite, Rockrimmon Road, near Chicopee, Mass.

WARREN BROTHERS COMPANY

Executive Offices: Boston, Mass.

District Offices:

New York, N. Y. — Chicago, Ill. — Los Angeles, Cal.
San Francisco, Cal. — Portland, Ore. — Phoenix, Ariz.
Richmond, Va. — Nashville, Tenn. — Utica, N. Y.
St. Louis, Mo. — Winnipeg, Man. — Montreal, P. Q.
Toronto, Ont. — Vancouver, B. C.

CONNERY'S NON-LEAKABLE WELDED

"HELD BY WELD" TAR AND ASPHALT KETTLES

COMBINATION HEATER AND DRYER

All Sizes and Styles.
Write for Specification.
Combination Heater and Dryer.
Separate yet combine One Fire so arranged to give required Heat.
Note the Improved Shut Off Door.
A Wonder for Repair Work.

Style "P"

10 Gallon Cap. Inside Pot lifts out, can be used for pouring Pot. Used by Highway Division Superintendents to patch small holes in road.

Stock Carried in Large Cities

STYLE "P"

Mfd. by CONNERY & CO. Inc., 2nd and Luzerne Sts., Philadelphia, Pa.

PENNSYLVANIA PORTLAND CEMENT

"One Source—One Mill—One Standard"

Every bag of Pennsylvania Cement, wherever obtained and for whatever purpose, has the same high quality required for government and public service work in which it is extensively used. Ask your dealer for Pennsylvania. If he cannot supply you, write direct to

Pennsylvania Cement Company, 30 East 42nd St., New York

PREVENT DUST
During The
DRY SEASON

Save your roads and eliminate the dust nuisance, by using

SOLVAY
Granulated
Calcium Chloride

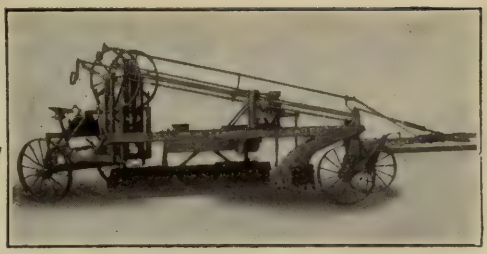
The practical, modern roadbinder and dust preventive. Absolutely odorless, it will not stain—needs no skilled labor, top dressing, nor road closing.

Sown dry with a lime spreader, it absorbs moisture from the air and aids in the natural cementing of the rock and soil. Two applications will last a season—Roads are kept firm, durable and dustless at least expense.

Write for Solvay Road Book sent free on request

SEMET-SOLVAY CO.
410 Milton Ave. Solvay, N. Y.

BUY WAR SAVINGS STAMPS!



Square Deal No. 8 Scarifier-Grader

Cuts Cost of Maintenance

Officials everywhere have found that the Adams Leaning-Wheel Scarifier-Grader, by leaning all its weight *against* the load, moves much more dirt with less power. In scarifying or grading and shaping up gravel or macadam streets, this means a considerable saving in time and power costs. The

ADAMS
ADJUSTABLE
Leaning-Wheel
GRADER

is guaranteed in actual road building or maintenance, to move more dirt with less *power* (mold board scouring and without side draft on the power) than any other grader of same length blade.

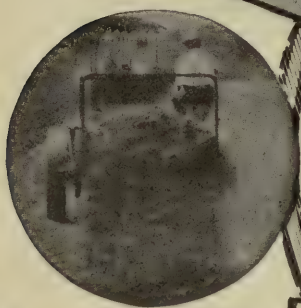
The economy and efficiency of the ADAMS Adjustable Leaning-Wheel Grader can be PROVED by TEST on your own road. Write for free illustrated catalog showing ADAMS Adjustable Leaning-Wheel Graders at work under various conditions. Ask for Catalog C.

The ADAMS Leaning-Wheel Grader leans against the load just as you'd do if you were pushing a loaded wheelbarrow up a hill. Catalog C gives full information.

J. D. ADAMS & CO.
Road Building Machinery
INDIANAPOLIS, IND.

and so does the ADAMS grader

SAVES HALF The Cost of Moving Dirt



Solves the labor problem for Road Builders — Supervisors — Dirt Moving Contractors. **Handles dirt, sand or gravel as fast as any other known method WITH HALF THE CREW—TWICE AS FAST WITH SAME CREW.** Cuts cost 50%. Moves dirt faster than 4-wheel scrapers can—one man and four horses do the work. **No plowing necessary** — this machine does **all** the work. Light running — Strong — Durable—Trouble-Proof. Pays for itself on one fair-sized job.

Loads 1½ Yds. of Dirt In 30 Seconds

Dumps dirt in piles or spreads it evenly as desired. Fastest method of making "fills" ever seen. **Not an experiment**—used by the biggest contractors in Iowa and **endorsed by all users** as cheapest and best dirt-moving equipment.

WRITE—Get full information about Spaulding Road Machine **now.** Ask about our special Jobbers and Dealers proposition if you are in position to represent us. Address

Spaulding Mfg. Co.
Dept. 240, **Grinnell, Iowa**

SPAULDING 2 —IN— ROAD MACHINE 1

A City Official

writing us recently says among other things: "Your

'Genuine Open Hearth Iron' Culverts

are certainly well adapted to city use as they can be laid nearer the surface of our streets than other types of culvert and are much easier installed than the pipes that come in short sections."

A pure Iron-Copper Alloy Sheet with a heavy spelter coat makes an ideal material for culvert construction. And that's what our culverts are made of.

They are practically permanent. Let us send you our booklet and prices.

The NEWPORT CULVERT CO., Inc.
NEWPORT, KY.

The Miracle of the Marne

The battle of the Marne halted the rush of the Germans towards Paris. It aroused the French to superhuman bravery. They fought as if led by the spirit of the Maid of Orleans herself.

The Marne was a demonstration of the power of patriotism with its back against the wall. The same sacrifice of self, the same love of country and unity of purpose that inspired the French people must inspire us, and we must win the war.

We are sending our best manhood to fight for us. They must be armed, fed and clothed, cared for through sickness and wounds. This is the work of every individual as well as the Government.

It is the proud duty of the Bell System to coordinate its purpose and equipment to the other factors in our national industrial fabric, so that the manufacture and movement of supplies to our boys abroad be given right of way.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
AND ASSOCIATED COMPANIES

One Policy *One System* *Universal Service*

The Municipal Buyers' Guide

A classified reference index of advertisers in this issue of The American City

The alphabetical index of advertisers which follows this list (see page 116) will give you the page numbers of all advertisements, thus enabling you to secure the full address of the advertisers, as well as other information which may be of value.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 116

Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark.

Aerial Ladder Trucks.
Couple-Gear Freight-Wheel Co.

Air Compressors.
General Electric Co.
Modern Iron Works.
Water Works Equipment Co.
Worthington Pump & Mach. Corp.

Air and Gas Washers.
Spray Engineering Co.

Ambulances.
White Co., The.

Antoxide.
Harrisons, Inc.

Arc Lamps.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Armored Concrete Pavements.
Trussed Concrete Steel Co.

Asbestos.
Carey Co., Philip.

Asphalt.
Carey Co., Philip.
Pioneer Asphalt Co.
Standard Oil Co.
Warren Bros. Co.

Asphalt Machinery.
Casey-Hedges Co.
Connery & Co., Inc.
Littleford Bros.
Warren Bros. Co.

Automobile Fire Apparatus.
American-La France Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Couple-Gear Freight-Wheel Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
South Bend Motor Car Works.
The White Co.

Automobile Lubricants.
Joseph Dixon Crucible Co.

Belt Dressing.
Joseph Dixon Crucible Co.

Blasting Supplies.
DuPont de Nemours & Co., E. I.

Blue Print Paper and Machines.
Kolesch & Co.

Books.
Appleton & Co., D.
Dutton & Co., E. P.
Wiley & Sons, John.

Braces, Extension.
Bond & Co., Harold L.
Modern Iron Works.

Brass Goods.
Anderson Coupling & Fire Sup. Co.
Clark Co., H. W.
Modern Iron Works.
Smith Co., A. P.
Water Works Equipment Co.

Brick, For Paving.
Dee Co., Wm. E.
Metropolitan Paving Brick Co.
Southern Clay Mfg. Co.

Buses, Motor.
White Co., The.

Calculating Machines.
Marchant Cal. Machine Co.

Campaigns for Commercial Organizations.
American City Bureau.

Cans for Ashes and Garbage.
American Can Co.
Buffalo Municipal Equipment Co.
Butler Mfg. Co.
Newport Culvert Co.
Rochester Can Co.
Steel Basket Co.

Can Carriers.
Steel Basket Co.

Cast Iron Pipe.
Donaldson Iron Co.
Glamorgan Pipe & Foundry Co.
Lynchburg Foundry Co.
Massillon Iron and Steel Co.
Zelnicker Supply Co., W. A.

Catch Basins.
Buffalo Municipal Equipment Co.
Casey-Hedges Co.
Clark Co., H. W.
Dee Co., Wm. E.
Modern Iron Works.
U. S. Cast Iron Pipe & Foundry Co.

Catch Basin Cleaning Apparatus.
Otterson Auto-Eductor Co.

Caulking Machinery.
Smith Co., A. P.

Caulking Materials.
Leadite Co.
Modern Iron Works.
United Lead Co.

Cemcoat.
Sonneborn Sons, Inc., L.

Cement.
Atlas Portland Cement Co.
Pennsylvania Cement Co.

Cement Inspection.
Allentown Testing Laboratories.
Hunt & Co., Robt. W.

Centrifugal Pumps.
Shone & Co.
Worthington Pump & Mach. Corp.

Certified Public Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark.

Check Valves.
Columbian Iron Works.

Chemical Analysis.
Allentown Testing Laboratories.
Hunt & Co., Robt. W.

Chemical Engines.
American-La France Fire Eng. Co.
Anderson Coup. & Fire Sup. Co.

Chemical Engineers.
Hunt & Co., Robt. W.

Chemicals for Water Purification.
Arnold, Hoffman & Co.
Bush-Beach & Gent.
Electric Ozone Sterilizer Co.
Electro Bleaching Gas Co.
General Filtration Co.
Great Western Electro Chem. Co.
Pennsylvania Salt Mfg. Co.
Wallace & Tiernan Co., Inc.

Coal Tar.
Barrett Co., The.
Carey Co., Philip.

Cold Storage and Refrigeration Systems.
Spray Engineering Co.

Concrete Culverts.
Storms Mfg. Co.

Concrete Mixers.
Jaeger Machine Co.
Worthington Pump & Mach. Corp.

Conduit Rods.
Bond & Co., Harold L.
Turbine Sewer Machine Co.

Conduits.
Fibre Conduit Co.
Schuylkill Valley Vit. Prod. Co.

Contractors' Equipment.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Baker Mfg. Co.
Bond Co., Harold L.
Connery & Co., Inc.
Garford Motor Truck Co.
General Motors Truck Co.
Good Roads Machinery Co.
Littleford Bros.
Packard Motor Car Co.
Ransome Leach Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.
Universal Road Machinery Co.

Contractors for Water Main Cleaning.
National Water Main Cleaning Co.

Culverts.
American Cast Iron Pipe Co.
Casey-Hedges Co.
Dee, Wm. E., Co.
Good Roads Machinery Co.
Newport Culvert Co.
Trussed Concrete Steel Co.
Sewer Pipe Mfrs. Association.
Storms Mfg. Co.
U. S. Cast Iron Pipe & Foundry Co.
Wood & Co., R. D.

Curb Bar.
Baker Co., R. D.
Trussed Concrete Steel Co.

Curb Boxes.
Casey-Hedges Co.
Clark Co., H. W.
East Iron & Machine Co.
Modern Iron Works.
S. E. T. Valve & Hydrant Co.

Current Meters.
Westinghouse Electric & Mfg. Co.

Derricks.
Taylor Portable Steel Derrick Co.

Drawing Instruments and Supplies.
Economy Drawing Table Co.
Gurley, W. & L. E.
Kolesch & Co.

Dump Carts and Wagons.
Austin-Western Road Machy. Co.
General Motors Truck Co.
Watson Wagon Co.

Dumping Wagon Bodies.
Austin-Western Road Machy. Co.

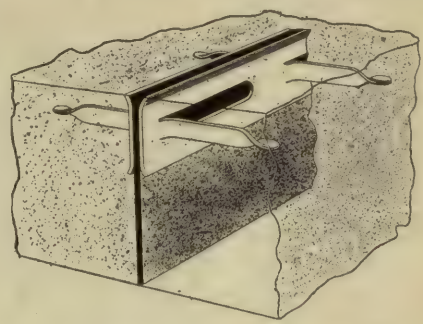
Continued on page 108

The TAYLOR

PORTABLE STEEL DERRICK with Gondola Car Attachment for HANDLING PIPE or other heavy material from gondola cars.

Catalog illustrating the Taylor Portable Steel Derricks furnished on application.

TAYLOR PORTABLE STEEL DERRICK CO.
213 W. Grand Ave., Chicago, Ill.



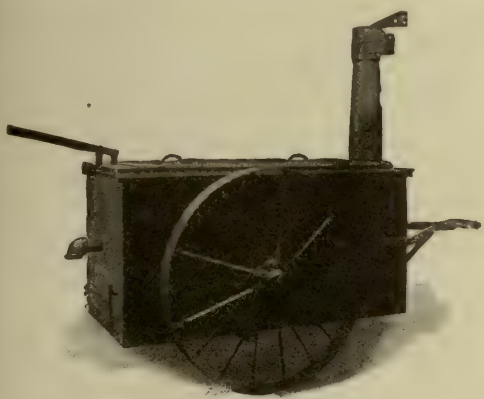
BAKER IMPROVED ARMOR PLATE

Protect the expansion joint of the concrete pavement. Keep it from breaking down under traffic by specifying steel protected joints.

Baker *Bevel Edged Plate,* easy to install and will wear down with the pavement.

Ask about Baker Armor plates and Installation System.

THE R. D. BAKER CO., DETROIT, MICH.



Two-Wheeled Heating Kettle
Furnished with or without spraying attachment

DON'T WAIT

until you want to use a

PORTABLE HEATING KETTLE

before ordering.

Order Now, and you will be sure to have the Kettle when you need it.

WE MAKE

many sizes of two-wheel and four-wheel kettles for heating any kind of oil or tar products.

At present we have a number of kettles in stock and can make immediate shipments.

Ask for Bulletin K. E. R.

THE GOOD ROADS MACHINERY CO.

Kennett Square, Pa.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 116

Dust Laying Compounds.
Barrett Mfg. Co.
Dustoline for Roads Co.
Semet-Solvay Co.
Standard Oil Co.

Electric Current Meters.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Generators and Motors.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Lamp Fixtures.
Cutter Co., George.
Electric Railway Equipment Co.

Electric Lamps.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electrical Supplies.
Bissell Co., F.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Enameled Iron Signs.
Baltimore Enamel & Novelty Co.

Engineers' and Surveyors' Instruments.
Buff & Buff Mfg. Co.
Kolesch & Co.

Engineers, Consulting.
Albright & Mebus.
Alvord, John W., & Brudick, Chas.
Ballard & Co., F. W.
Black & Veatch.
Blanchard, A. H.
Burns & McDonnell.
Caird, James M.
Chester & Fleming.
Cravath, J. R.
Crosby, W. W.
Duluth Engineering Co.
Dunham-Clarin Co.
Flood, Walter H.
Fuller & McClintock.
Gannett, Seelye & Fleming.
Greeley, Samuel A.
Gregory, John H.
Harding, James.
Hazen, Whipple & Fuller.
Hering, Rudolph.
Higgins, J. Wallace.
Hopkins, Charles C.
Hunt & Co., Robt. W.
Jennings, Lawrence & Lindsey.
Johnson, Geo. A.
Kimberly, A. Elliot.
Knowles, Morris.
Leavitt, Chas. W.
Ludlow, J. L.
McCrary Co., J. B.
Minnesota Engineering Co.
Mitchell, Hugh C.
Pollock, Clarence D.
Potter, Alexander.
Potts, Clyde.
Scofield Engineering Co.
Utilities Engineering Co.
Warren Engineering Co.
Washtenaw Engineering Co.

Engine, Gas. (See Gas Engines.)

Expansion Joint Material.
Barrett Mfg. Co.
Carey Co., Philip.
Pioneer Asphalt Co.
Trussed Concrete Steel Co.

Fencing.
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Co.
Wright Wire Co.

Fertilizers.
Dreer, Henry A.

Filing Cabinets.
Ecomony Drawing Table Co.

Filters-Feed Water.
Pittsburgh Filter Mfg. Co.

Filtration Plants.
N. Y. Continental-Jewell Filtra. Co.
Norwood Engineering Co.
Pittsburgh Filter Mfg. Co.

Fire Alarm Cables.
Simplex Wire & Cable Co.

Fire Alarm Signals, Steam.
Union Water Meter Co.

Fire Alarm Systems.
Anderson Coupling & Fire Sup. Co.
Gamewell Fire Alarm Telegraph Co.
Loper Fire Alarm Co.

Fire Department Apparatus.
American-LaFrance Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Couple-Gear Freight-Wheel Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
South Bend Motor Car Works.
White Co., The.

Fire Department Supplies.
Anderson Coupling & Fire Sup. Co.

Fire Escapes.
Barnum Iron Works, E. T.

Fire Extinguishers, Chemical.
American-LaFrance Fire Engine Co.
Anderson Coupling & Fire Sup. Co.

Fire Hose.
Anderson Coupling & Fire Sup. Co.
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

Fire Pumps.
Worthington Pump and Machinery Corporation.

Flag Poles.
Barnum Iron Works, E. T.

Flexible Joints.
U. S. Cast Iron Pipe & Fdry. Co.

Flower Bed Guards.
Barnum Iron Works, E. T.
Wright Wire Co.

Fountains.
Barnum Iron & Wire Works, E. T.
Casey-Hedges Co.
Mott Iron Works, J. L.
Puro Sanitary Drinking Foun. Co.
Rundle-Spence Mfg. Co.
Stewart Iron Works Co.

Furnaces, Melting.
Leadite Co.
Modern Iron Works.

Garbage Cans—See Cans for Ashes and Garbage.

Garbage Wagons.
Austin-Western Road Machy. Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
Watson Wagon Co.
White Co., The.

Gas Engines.
Bruce-Macbeth Engine Co.
Westinghouse Electric & Mfg. Co.
Worthington Pump & Mach. Corp.

Gaskets.
Leadite Co.

Gas Meters.
General Electric Co.
Pittsburgh Meter Co.

Gasoline Pumping Engines.
Bond Co., Harold L.
Modern Iron Works.
Worthington Pump & Mach. Corp.

Gasoline Storage Tanks.
Bowser & Co., Inc., S. F.

Gates For Parks and Cemeteries.
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Company.
Wright Wire Co.

Gauges—Surface, Reservoir and Special Water Works.
Clark Co., H. W.

Graders.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Graphite.
Dixon Crucible Co., Joseph.

Grass Seed.
Burpee Co., W. Atlee.
Dreer, Henry A.
Thorburn & Co., J. M.

Health and Amusement Devices.
American Playground Device Co.
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.
Noll Bros.

Heating Kettles.
Connery & Co., Inc.

High Pressure Hydrants.
Smith Co., A. P.

Hitching Posts.
Barnum Iron & Wire Works, E. T.
Casey-Hedges Co.

Hose.
Anderson Coupling & Fire Sup. Co.
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

House Numbers.
Baltimore Enamel & Novelty Co.
Buffalo Municipal Equipment Co.

Hydrants.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Mfg. Co.
Norwood Engineering Co.
Pratt & Cady, Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
Wood & Co., R. D.

Indicator Posts.
Columbian Iron Works.
Flower-Stephens Mfg. Co.
Ludlow Valve Mfg. Co.
Pratt & Cady, Inc.
Rensselaer Valve Co.

Insect-Ban.
Eggert Chemical Co.

Insulating Materials.
Carey Co., Philip.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Insulated Wire and Cable.
Bissell Co., F.
General Electric Co.
Simplex Wire & Cable Co.

Iron Collapsible Forms For Moulding Concrete.
Clark Co., H. W.
Ford Meter Box Co.
Storms Mfg. Co.

Jail Cells and Jail Work.
Barnum Iron Works, E. T.

Joints, Flexible.
Coldwell-Wilcox Co.

Kahn Armour Plates.
Trussed Concrete Steel Co.

Continued on page 110

BACK OF THE PERFECT CURBING ARE KAHN CURB BARS

They provide the best and most economical method of protecting and reinforcing concrete curbing for either business or residential streets. There is no separating or splitting of the concrete at the corners, on account of the open spaces in the anchorage, which is absolutely positive.

Kahn Curb Bars are manufactured from special rolled steel sections, and are heavily galvanized after forming. They are furnished in either straight or curved bars and provide a protection of 1⅝ inches. Standard lengths 8, 10 and 12 feet.

STANDARDIZED TRUSCON BUILDING PRODUCTS

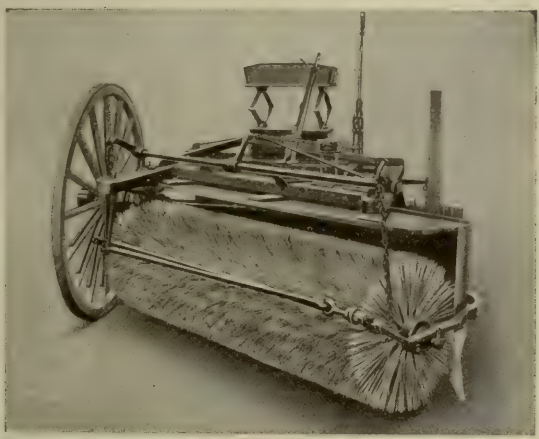
TRUSCON STEEL COMPANY

(Trussed Concrete Steel Company)

Department C-43 Youngstown, Ohio

Representatives in Principal Cities

STANDARDIZED TRUSCON BUILDING PRODUCTS



Clean Streets

In order to have and maintain clean, "dustless" streets, the use of a strong, durable street sweeper is essential. The Reliance Sweeper has won fame throughout the contry as THE sweeper

Sweeps clean any kind of pavement. Simple in construction—simple to operate. Made of the best materials.

Effectiveness, Strength and Durability are its Main Features.

WRITE FOR ILLUSTRATED BOOKLET

THE UNIVERSAL ROAD MACHINERY CO.

KINGSTON, N. Y.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 116

Kettles, Tar and Asphalt.
Connery & Co., Inc.

Landscape Architects.
Arnold, Sheffield A.
Cole, Louis S.
Cowell, Arthur W.
Cullen, Wm. E.
Davey Tree Expert Co.
Hare & Hare.
Helder, Arthur H.
Higgins, J. Wallace.
Horvath, M. H.
Leavitt, Chas. W.
Nutter, Frank H.

Lapidolith.
Sonneborn Sons, Inc., L.

Lawn Mowers.
Austin Western Road Machy. Co.
Manufacturers Distributing Co.
Milbradt Mfg. Co.
Pennsylvania Lawn Mower Works.
Shawnee Mower Co.

Lawn Sweepers and Sprinklers.
Everwear Mfg. Co.
Pennsylvania Lawn Mower Co.
Spray Engineering Co.

Lead Furnaces & Caulking Tools.
Modern Iron Works.
Smith, N. P.
Water Works Equipment Co.

Leadite.
Leadite Co.

Lead Wool.
United Lead Co.

Leak Finders.
Clark & Co., H. W.
Modern Iron Works.
Pitometer Co.
Water Works Equipment Co.

Liquid Chlorine.
Arnold, Hoffman & Co.
Bush-Beach & Gent.
Electro Bleaching Gas Co.
Great Western Electro Chem. Co.
Pennsylvania Salt Co.
Wallace & Tiernan Co., Inc.

Lighting Standards.
Casey-Hedges Co.
Cutter Co., George.
Electric Railway Equipment Co.
King Foundry Co.
Mott Iron Works, J. L.
Stewart Iron Works Co.

Lubricants.
Dixon Crucible Co., Joseph.

Lngmotors.
Life Saving Devices Co.

Manhole Covers.
Barnum Iron Works, E. T.
Casey-Hedges Co.
Clark Co., H. W.
Columbian Iron Works.
East Iron & Machine Co.
Modern Iron Works.
Mott Iron Works, J. L.
S. E. T. Valve & Hydrant Co.
U. S. Cast Iron Pipe & Foundry Co.
Wood & Co., R. D.

Merry-Go-Rounds.
American Playground Device Co.
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.

Metal Preservatives.
Dixon Crucible Co., Joseph.
Harrisons, Inc.

Meter Books.
Buffalo Meter Co.
Pittsburgh Meter Co.

Meter Boxes.
Buffalo Meter Co.
Casey-Hedges Co.
Clark Co., H. W.
Columbian Iron Works.
Ford Meter Box Co.
Hersey Mfg. Co.
Modern Iron Works.
Pittsburgh Meter Co.
S. E. T. Valve & Hydrant Co.

Meter Couplings.
Clark Co., H. W.
Ford Meter Box Co.
Modern Iron Works.
Pittsburgh Meter Co.

Meter Holding Devices.
Ford Meter Box Co.
Modern Iron Works.

Meter Testers.
Buffalo Meter Co.
Clark Co., H. W.
Ford Meter Box Co.
Neptune Meter Co.
Pittsburgh Meter Co.

Meters—See Water and Gas Meters.

Motor Trucks.
Couple-Gear Freight-Wheel Co.
General Motors Truck Co.
Garford Motor Truck Co.
Packard Motor Car Co.
White Co., The.

Motor Fire Apparatus—See Automobile Fire Apparatus.

Motor Truck Trailers.
Watson Wagon Co.

Municipal Auditors.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark.

Nurseries.
American Nursery Co.
Andorra Nurseries.
Bobbink & Atkins.
Donaldson Co.
Dreer, Henry A.
Harrison Nursery Co.
Hicks Nurseries.
Kohankie & Son, Henry.
Meehan Co., Thomas.
Smith Co., W. & T.
Storrs & Harrison Co.

Oil Tanks.
Connery & Co., Inc.

Ornamental Metal Fencing.
Barnum Iron & Wire Works, E. T.
Mott Iron Works Co., J. L.
Stewart Iron Works Co.
Wright Wire Co.

Packing.
Carey Co., Philip.

Paint Gun (Pneumatic).
Spray Engineering Co.

Park Management and Advice.
Benjamin E. Gage.

Park Benches.
American Playground Device Co.
Ashland Mfg. Co.
Barnum Iron & Wire Works, E. T.
Casey-Hedges Co.
Enterprise Iron Works.
Mott Iron Works, J. L.
Noll Brothers.
Stewart Iron Works Co.

Park and Lawn Sprinklers.
Penn. Lawn Mower Works.
Spray Engineering Co.

Park Swings.
Noll Brothers.

Paving Inspection.
Allentown Testing Laboratories.
Hunt & Co., Robt. W.

Paving Machinery and Tools.
Warren Bros. Co.

Paving Materials. (See also under Brick and Cement.)
Barrett Co., The.
Carey Co., Philip.
Standard Oil Co.
Warren Bros. Co.

Paving Mixers.
Warren Bros. Co.
Worthington Pump and Machinery Corporation.

Paving Mixtures.
Standard Oil Co.

Pencils, Drafting, Office.
Dixon Crucible Co., Joseph.

Pipe.
American Cast Iron Pipe Co.
Casey-Hedges Co.
Cast Iron Pipe Pub. Bureau, R. C. McWane, Sec.
Central Foundry Co.
Clow & Sons, James B.
Donaldson Iron Co.
Glamorgan Pipe & Foundry Co.
Lynchburg Foundry Co.
Massillon Iron & Steel Co.
U. S. Cast Iron Pipe & Foundry Co
Warren Fdry. & Machine Co.
Wood & Co., R. D.
Zelnicker Supply Co., W. A.

Pipe Covering.
Carey & Co., Philip.

Pipe Cutters.
Smith Co., A. P.
Water Works Equipment Co.

Pipe Handling Machinery.
Taylor Portable Steel Derrick Co.

Pipe Joint Compound.
Dixon Crucible Co., Joseph.

Pipe Jointing Materials.
Leadite Co.
United Lead Co.
Water Works Equipment Co.

Pipe Locators.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co.

Pitch.
Barrett Co., The.
Carey Co., Philip.

Pitometers.
Pitometer Co., The.

Playground Apparatus.
American Playground Device Co.
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.

Pneumatic Tools.
United Lead Co.

Continued on page 112

NO DELAYS FOR LOADING WATSON TRAILERS

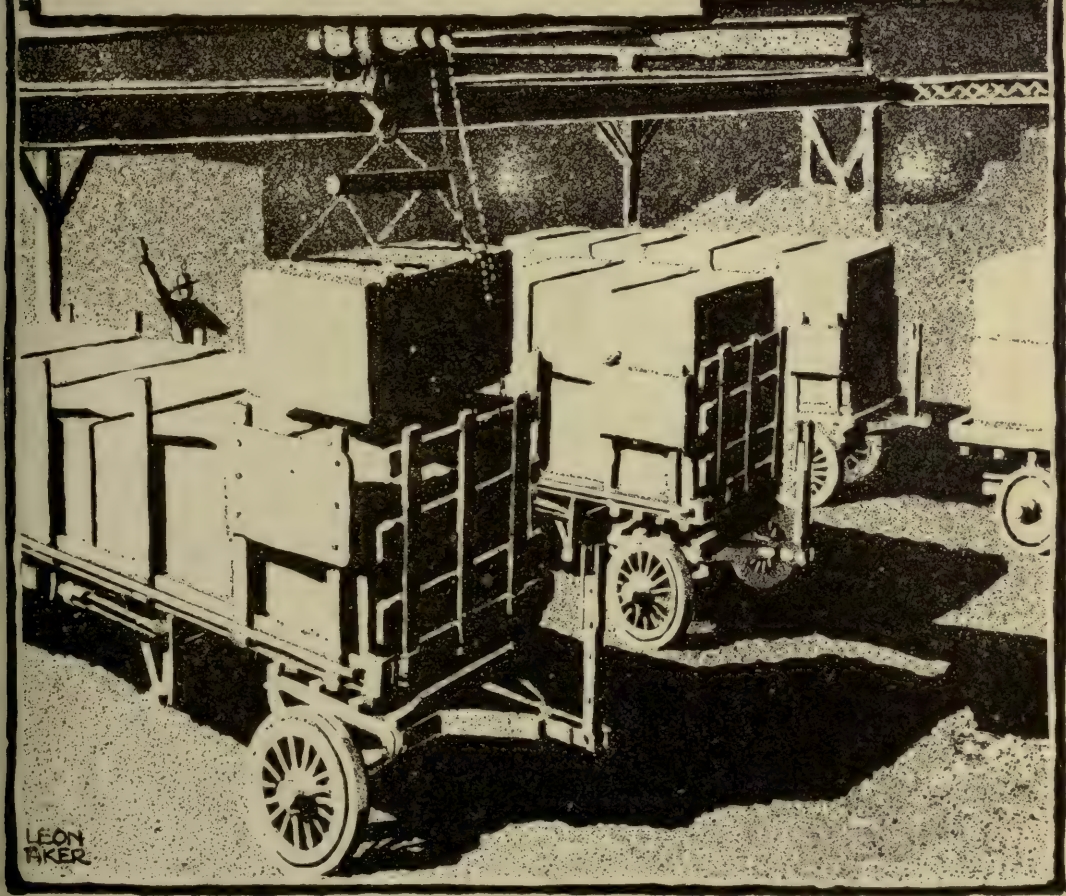
Set out your WATSON TRAILERS in the yard or on the job. Load or unload them without delaying your motor equipment. Trucks are away working while the gang handles the load on the trailers.

Use the full power of your motor equipment.

WATSON TRAILERS will increase the motor truck's hauling capacity as high as 400% in many cases.

Watson Trailers and Semi-Trailers are built in capacities up to 5 tons. Platform body or bottom dump. Full details on the pamphlet—"Heavy Hauling." Write for your copy.

WATSON WAGON Co
30 East Center Str.
Canastota, N.Y.



Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 116

Poles, Combination Railway and Lighting.
Cutter Co., George.
Electric Railway Equipment Co.
Mott Iron Works, J. L.
Ornamental Lighting Pole Co.

Police Patrols.
General Motors Truck Co.
White Co., The.

Police Signal Cables.
Simplex Wire & Cable Co.

Police Signal Systems.
Gamewell Fire Alarm Telegraph Co.

Portable Derricks.
Taylor Portable Steel Derrick Co.

Portland Cement.
Pennsylvania Cement Co.

Powder.
DuPont de Nemours & Co., E. I.

Producers—Gas Power Plants.
Bruce-Macbeth Engine Co.
Westinghouse Electric & Mfg. Co.

Publishers.
Appleton & Co., D.
Dutton & Co., E. P.
Engineering News-Record.
Wiley & Sons, John.

Pumping Machinery.
Bond Co., Harold L.
Deming Co.
Shone Co.
Wood & Co., R. D.
Worthington Pump and Mach. Corp.

Ramshorn Meter Holding Frame.
Ford Meter Box Co.

Reinforcing for Paving.
Trussed Concrete Steel Co.

Repair Lids for Service Boxes.
Clark Co., H. W.
Modern Iron Works.

Road and Street Machinery.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Baker Mfg. Co.
Buffalo-Springfield Roller Co.
Connery & Co., Inc.
Garford Motor Truck Co.
The Good Roads Machinery Co.
Littleford Bros.
Newport Culvert Co.
Packard Motor Car Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.
Universal Road Machinery Co.
Warren Bros. Co.
White Co., The.

Road Binders.
Barrett Co., The.
Semet-Solvay Co.
Standard Oil Co.

Road Culverts.
Casey-Hedges Co.
Good Roads Machy. Co.
Newport Culvert Co.
Storms Mfg. Co.
U. S. Cast Iron Pipe & Fdry. Co.
Wood & Co., R. D.

Road Drag and Street Scrapers.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
The Good Roads Machinery Co.
Newport Culvert Co.
Rochester Can Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Road Oil.
Barrett Co., The.
Dustoline for Roads Co.
Standard Oil Co.

Road Oilers.
Austin-Western Road Machy. Co.
Etnyre & Co., E. D.
General Motors Truck Co.
Good Roads Machinery Co.
Universal Road Machinery Co.
White Co., The.

Road Rollers.
Austin-Western Road Machy. Co.
Buffalo Springfield Roller Co.
Good Roads Machinery Co.

Rock Crushers.
Austin-Western Road Machy. Co.
Good Roads Machy. Co.
Universal Road Machinery Co.
Worthington Pump & Mach. Corp.

Roofing.
Barrett Co., The.
Carey Co., Philip.

Rubber Tires.—See Tires, Rubber.

Rubbish Burners.
Barnum Iron Works, E. T.

Rust Preventing Material.
Dixon Crucible Co., Jos.
Harrisons, Inc.

Safety Manhole Cover.
East Iron & Machine Co.

Sand Spreaders.
Buffalo Municipal Equipment Co.

Sanitary Drinking Fountains.
Barnum Iron Works.
Casey-Hedges Co.
Mott Iron Works, J. L.
Rundle-Spence Mfg. Co.
Stewart Iron Works Co.

Scarifiers.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Good Roads Machinery Co.
Newport Culvert Co.
Universal Road Machy. Co.

Seeds, Plants and Bulbs.
Burpee Co., W. Atlee.
Dreer, Henry A.
Hicks Nurseries.
Storrs & Harrison Co.
Thorburn & Co., J. M.

Service Boxes.
Casey-Hedges Co.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co.

Service Box Finders.
Clark Co., H. W.

Sewerage Disposal.
Spray Engineering Co.

Sewage Ejectors.
Otterson Auto-Eductor Co.
Shone Co.

Sewer Buckets.
Champion Potato Machinery Co.
Metropolitan Paving Brick Co.

Sewer Castings.
Casey-Hedges Co.
Clark Co., H. W.
Dee Co., Wm. E.
Enterprise Iron Works.

Sewer Cleaning Apparatus.
Buffalo Municipal Equipment Co.
Champion Potato Machinery Co.
Turbine Sewer Machine Co.

Sewer Jacks.
Ashland Mfg. Co.

Sewer Pipe.
Dee Co., Wm. E.
Sewer Pipe Mfrs. Assn.

Sewer Rods.
Bond Co., Harold L.
Champion Potato Machinery Co.
Turbine Sewer Machine Co.

Sheer Gates.
Chapman Valve Mfg. Co.
Columbian Iron Works.
Rensselaer Valve Co.

Signs—Iron and Wire.
Barnum Iron Works, E. T.
Buffalo Municipal Equipment Co.
Early, Jos. N.
Lebanon Iron & Machine Co.
Union Iron Products Co.

Sleeves and Valves.
Flower-Stephens Mfg. Co.
Rensselaer Valve Co.

Sluice Gates and Valves.
Chapman Valve Mfg. Co.
Coldwell Wilcox Co.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Rensselaer Valve Co.

Snow Cleaning Machinery.
Good Roads Machinery Co.
Russell Grader Mfg. Co.

Snow Plows.
Baker Mfg. Co.
Good Roads Machinery Co.
Newport Culvert Co.
Russell Grader Mfg. Co.

Soil Pipe (Cast Iron).
Abendroth Bros.
Alabama Pipe & Foundry Co.
American Enameling Mfg. Co.
American Foundry & Pipe Co.
Anniston Foundry Co.
Bessemer Soil Pipe Co.
Campbell Mfg. Co.
Casey-Hedges Co., The.
Central Foundry Co.
Charlotte Pipe and Foundry Corp.
Coosa Pipe & Foundry Co.
Crown Pipe and Foundry Co.
Gadsden Pipe Co.
Haines, Jones & Cadbury Co.
Johnson Co., J. D.
Krupp Foundry Co.
Medina Foundry Co.
National Pipe & Fdry. Co.
Reading Foundry & Supply Co.
Salem Brass & Iron Mfg. Co.
Sanitary Co. of America.
Somerville Iron Works, The.
Standard Foundry Co.
Superior Mfg. Co.
Union Foundry Co.
Weiskittel & Son Co., A.
Wetter Mfg. Co., H.

Spiral Riveted Pipe.
Casey-Hedges Co.

Spraying Machinery for Trees an Shrubs.
Deming Co.

Spray Nozzles.
Spray Engineering Co.

Continued on page 114

THE STANDARD METHOD of SURFACE TREATMENT

Below is a water bonded Gravel Road treated with Stanolind Paving Asphalt at 300°F., 45 pounds pressure, applied one-half gallon to the square yard by special pressure tank wagon shown in other illustration.

One application of Stanolind Paving Asphalt on Macadam and Gravel Roads has given three years' service with practically no expense. Builds more substantial surface at half the cost of light oil treatment for three years. Can be applied on roads previously treated with Road Oil.

Write today for free booklet, "Stanolind Paving Asphalt."

STANDARD OIL COMPANY
(INDIANA)
72 W. Adams Street, Chicago, Ill.

Austin Portable Gyratory Crushers

are the economical solution of many difficulties arising in street, sewer and bridge or building construction; in fact, any job entailing broken stone supply within city limits.

Austin Gyratory Crushers, both fixed and portable types, have been used on such work as New York Subway and Water Tunnels and Chicago city streets to crush old paving blocks and in the water tunnel under Lake Michigan. Their reliable working and excellent construction saved thousands of dollars on these projects of first importance.

Write for catalog.

AUSTIN MANUFACTURING COMPANY - CHICAGO

New York Office—50 Church St.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisers follows this classfied list. See page 116

Standpipes.
Casey-Hedges Co.
Connery & Co., Inc.
Wood & Co., R. D.

Steel Derricks.
Taylor Portable Steel Derrick Co.

Street Cleaning Machines (Motor Driven).
Garford Motor Truck Co.
General Motors Truck Co.
White Co., The.

Street Flushers.
Buffalo Municipal Equipment Co.
Etnyre & Co., E. D.
Garford Motor Truck Co.
General Motors Truck Co.
Sterling Motor Truck Co.
White Co., The.

Street Lamps—Electric.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Street Lamp Posts.
Barnum Iron Works, E. T.
Casey-Hedges Co.
Cutter Co., George.
Electric Railway Equipment Co.
King Foundry Co.
Mott Iron Works, J. L.
Stewart Iron Works Co.

Street and Road Graders.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Good Roads Machy. Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Street and Road Signs.
Baltimore Enamel & Novelty Co.
Buffalo Municipal Equipment Co.
Early, Jos. N.
Lebanon Iron & Machine Co.
Union Iron Products Co.

Street Sign Posts.
Casey-Hedges Co.
Cutter Co., George.
Early, Jos. N.
Lebanon Iron & Machine Co.
Mott Iron Works, J. L.

Street Sprinklers.
Austin-Western Road Machy. Co.
Buffalo Municipal Equipment Co.
Etnyre & Co., E. D.
Garford Motor Truck Co.
General Motors Truck Co.
Water Works Equipment Co.
White Co., The.

Street Sweepers.
Austin-Western Road Machy. Co.
Universal Road Machinery Co.

Street Trash Cans.
American Can Co.
Butler Mfg. Co.
Rochester Can Co.
Steel Basket Co.

Surveyors Instruments.
Buff & Buff Co.
Kolesch & Co.

Tanks, Storage for Oils and Gasoline.
Bowser & Co., Inc., S. F.
Connery & Co., Inc.

Tanks and Towers.
Casey-Hedges Co.
Newport Culvert Co.
Wood & Co., R. D.
Zelnicker Supply Co., W. A.

Tapping Machines.
Smith Co., A. P.
Water Works Equipment Co.

Tar.
Barrett Co., The.

Tar & Asphalt Spreaders.
White Co., The.

Tar Kettles.
Casey-Hedges Co.
Connery & Co., Inc.
Good Roads Machinery Co.
Littleford Bros.
Warren Bros. Co.

Tar Wagons.
Casey-Hedges Co.

Tarvia.
Barrett Co., The.

Testing Laboratories.
Allentown Testing Laboratory Co.
Hunt & Co., Robt. W.

Tires, Rubber.
Dayton Rubber Mfg. Co.
Firestone Tire & Rubber Co.
Fisk Rubber Co.
Goodrich Co., B. F.
Republic Rubber Corp.
U. S. Tire Co.

Traction Engines.
Buffalo Springfield Roller Co.

Traction Trains.
Buffalo Springfield Roller Co.

Tractors.
American-La France Fire Engine Co.
Garford Motor Truck Co.
General Motors Truck Co.
Watson Wagon Co.
White Co., The.

Traffic Posts.
George Cutter Co.
Buffalo Municipal Equipment Co.
Lebanon Iron & Machine Co.

Traffic Regulation Signs.
Baltimore Enamel & Novelty Co.
Buffalo Municipal Equipment Co.
Early, Joe N.
Lebanon Iron & Machine Co.
Union Iron Products Co.

Trailers.
Buffalo Springfield Roller Co.
Watson Wagon Co.

Tree and Flower Bed Guards.
Mott Iron Works, J. L.
Wright Wire Co.

Tree Protection.
Eggert Chemical Co.

Trench Braces.
Bond Co., Harold L.

Trench Pumps.
Bond Co., Harold L.
Deming Co.
Modern Iron Works.
Water Works Equipment Co.
Worthington Pump & Mach. Corp.

Turbines.
Westinghouse Electric & Mfg. Co.

Vacuum Pumps.
Deming Co.
Worthington Pump & Mach. Corp.

Valves.
Ashland Mfg. Co.
Chapman Valve Mfg. Co.
Coldwell-Wilcox Co.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Pratt & Cady Co., Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
Water Works Equipment Co.
Wood & Co., R. D.

Valve Boxes and Housings.
Casey-Hedges Co.
Clark Co., H. W.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Modern Iron Works.
Pratt & Cady Co., Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
U. S. Cast Iron Pipe & Foundry C
Wood & Co., R. D.

Valve Inserting Machinery.
Smith Co., A. P.

Valve Seats.
Wood & Co., R. D.

Valve Specialties.
Chapman Valve Mfg. Co.
S. E. T. Valve & Hydrant Co.

Wagons and Carts.
Watson Wagon Co.

Water Works Conservation.
National Water Main Cleaning C
Pitometer Co.
Water Works Equipment Co.

Water Main Cleaning.
National Water Main Cleaning C

Water Meters.
Badger Meter Mfg. Co.
Buffalo Meter Co.
General Electric Co.
Hersey Mfg. Co.
Neptune Meter Co.
Pittsburgh Meter Co.
Thomson Meter Co.
Union Water Meter Co.
Worthington Pump & Mach. Cor

Waterproofing.
Barrett Mfg. Co.
Carey Co., Philip.
Minwax Co.
Sonneborn Sons, Inc., L.
Trussed Concrete Steel Co.

Water Purification Chemicals.
See Chemicals for Water Purific tion.

Water Regulators.
Modern Iron Works.
Union Water Meter Co.

Water Towers.
Casey-Hedges Co.

Water Works Specialties.
Casey-Hedges Co.
Chapman Valve Mfg. Co.
Clark Co., H. W.
Flower-Stephens Mfg. Co.
Leadite Co.
Minwax Co.
Modern Iron Works.
Pittsburgh Filter Co.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
Union Water Meter Co.
United Lead Co.
Warren Fdry. & Machine Co.
Water Works Equipment Co.

Well Construction & Equipmen
Clark Co., H. W.

Wheel Scrapers.
Adams & Co., J. D.
Austin-Western Road Machy. Co
Good Roads Machinery Co.

Wire and Cable.
General Electric Co.
Simplex Wire & Cable Co.

Wire-Cut-Lug Brick.
Metropolitan Paving Brick Co.
Southern Clay Mfg. Co.

Wood Preservatives.
Barrett Co., The.

PENNSYLVANIA
Quality
LAWN MOWERS

You realize that lawn mower blades have to be constantly sharpened to cut easily and clean—dull blades drag and chop. An exclusive feature of "PENNSYLVANIA" *Quality* Lawn Mowers is that *all* blades are of crucible tool steel (oil-hardened and water-tempered) with self-sharpening action.

PENNSYLVANIA LAWN MOWER WORKS, Philadelphia

Sold by Hardware Dealers and Seedsmen

FREE—A booklet, "How to Care for the Lawn"—written by an authority—mailed on request.

This Trademark
ON THE HANDLES OF
"Pennsylvania"
"Pennsylvania Jr."
"Pennsylvania Golf"
"Pennsylvania Putting Greens Mower"
"Pennsylvania Pony"
"Pennsylvania Horse"
"Pennsylvania Grand"
"Pennsylvania Trio"
"Continental"
"Great American B. B."
"Shock Absorber"
"Quaker City" "Delta"
"Red Cloud" "Electra"
"Bellevue" "Panama"

Index to Advertisers in this Issue of The American City

Abendroth Bros. 17
Adams & Co., J. D. 103
Alabama Pipe & Foundry Co. 17
Albright & Mebus 95
Allentown Testing Laboratory Co. 95
Alvord, J. W., & C. B. Burdick .. 95
American Can Co. 44
American Cast Iron Pipe Co. 24
American City Bureau 83
American Enameling Mfg. Corp. .. 17
American Foundry & Pipe Co. .. 17
American-LaFrance Fire Eng. Co. 65
American Nursery Co. 92
American Playground Device Co. 77
American Telephone & Tel. Co. .. 105
Anderson Coup. & Fire Supply Co. 72
Andorra Nurseries 93
Anniston Foundry Co. 17
Appleton & Co., D. 33
Arnold, Hoffman & Co. 25
Arnold, Sheffield, A. 95
Arnold & Tripp 95
Ashland Mfg. Co. 82
Austin Western Road Mach'y Co. 113

Badger Meter Mfg. Co. 14
Baker Co., R. D. 107
Baker Mfg. Co. 75
Ballard & Co., F. W. 97
Baltimore Enamel & Novelty Co. 73
Barnes Co., A. S. 74
Barnum Iron Works, E. T. 76
Barrett Co., The 61
Bessemer Soil Pipe Co. 17
Bi-Lateral Fire Hose Co. 71
Black & Veatch 95
Blanchard, Arthur H. 95
Bobbink & Atkins 92
Bond Co., Harold L. 41-55
Bowser & Co., Inc., S. F. 70
Bruce-Macbeth Engine Co. 23
Buff & Buff Mfg. Co. 100
Buffalo Meter Co. 29
Buffalo Municipal Equip. Co. 43-53
Buffalo Springfield Roller Co. 100
Bureau of Municipal Research 72
Burns & McDonnell 95
Burpee & Co., W. Atlee 91
Bush-Beach-Gent 28
Butler Mfg. Co. 90

Caird, James M. 95
Campbell Mfg. Co. 17
Carey Co., Philip 4-5
Casey-Hedges Co. 86
Cast Iron Pipe Pub. Bureau .. 31, 36-37
Central Foundry Co. 17-21
Champion Potato Machinery Co. 24
Chapman Valve Mfg. Co. 19
Charlotte Pipe and Foundry Co. 97
Chester & Fleming 95
Clark Co., H. W. 29-40
Coldwell-Wilcox Co. 25
Cole, L. S. 95
Columbian Iron Works Co. 22
Connery & Co., Inc. 102
Coosa Pipe & Foundry Co. 17
Couple-Gear Freight Wheel Co. .. 72
Cravath, J. R. 95
Crown Pipe & Foundry Co. 17
Cullen, Wm. F. 95
Cutter, Geo., Co. 117

Davey Tree Expert Co. 93
Dayton Rubber Mfg. Co. 71
Dee Co., Wm. E. 23
Deming Co., The 47
Dixon Crucible Co., Joseph 55
Donaldson Co. (Willadean Nurs.) 92
Dreer, Henry A. 94
Duluth Engineering Co. 77
Dunham-Clarin Co., F. A. 77
Du Pont Powder Co. 98
Dustoline for Roads Co. 85
Dutton & Co., E. P. 97

Early, Jos. N. 53
East Iron & Machine Co. 29
Economy Drawing Table Co. 81
Eddy Valve Co. 22
Electric Ozone Sterilizer Co. 55
Eggert Chemical Co. 81
Electric Railway Equipment Co. 59

Electro Bleaching Gas Co. 28
Engineering News-Record 56
Enterprise Iron Works 93
Etnyre & Co., E. D. 100
Everwear Mfg. Co. 8-9

Fabric Fire Hose Co. 68
Fibre Conduit Co. 94
Firestone Tire & Rubber Co. 64
Fisk Rubber Co. 118
Flood, Walter H. 95
Flower-Stephens Mfg. Co. 23
Foos Gas Engine Co. 55
Ford Meter Box Co. 20
Framingham Nursery Co. 92
Fuller & McClintock 95

Gadsden Pipe Co. 17
Gage, Benj. E. 74
Gamewell Fire Alarm T. Co. 74
Gannett, Seelye & Fleming 95
Garford Motor Truck Co. 67
General Electric Co. 2-84
General Filtration Co. 22
General Motors Truck Co. 63
George, Howard 72
Goodrich Rubber Co., B. F. 6-7
Good Roads Mach'y Co. 107
Great Western Electro Chem. Co 28
Greeley, Samuel A. 95
Gregory, John H. 95

Haines, Jones & Cadbury Co. 17
Hansen, A. E. 95
Harding, James 96
Hare & Hare 96
Harrison Nursery Co. 93
Hazen, Whipple & Fuller 96
Helder, Arthur H. 96
Hering, Rudolph 96
Hersey Manufacturing Co. 25
Hicks Nurseries 90
Higgins, J. Wallace 96
Hill-Standard Co. 79
Hopkins, Chas. C. 96
Horvath, M. B. 96
Hunt & Co., Robert W. 97

Jacobs J. L. 96
Jaeger Machine Co. 99
Jennings, Lawrence & Lindsey 96
Johnson Co., J. D. 17
Johnson, Geo. A. 96

Kimberly, A. Elliot 96
King Foundry Co. 53
Kittredge, H. C. 96
Knowles, H. C. 96
Kohankie & Son, Henry 93
Kolesch & Co. 101
Krupp Foundry Co. 17

Leadite Co., The 22
Leavitt, Chas. W. 96
Lebanon Machine Co. 53
Lewis & Valentine 93
Life Saving Devices Co. 55
Littleford Bros. 100
Loper Fire Alarm Co. 72
Ludlow, J. L. 96
Ludlow Valve Mfg. Co. 22
Lynchburg Foundry Co. 38-101

Manufacturers Dist. Co. 94
Marchant Calculating Mach. Co. 75
Medart Mfg. Co., Fred 77
Medina Foundry Co. 17
Meehan Co., Thos. B. 91
Meehan, Thos., & Sons 96
Metropolitan Pav. Brick Co., The 53
Milbradt Mfg. Co. 75
Minwax Co. 23-45
Mitchell, Hugh C. 96
Modern Iron Works 28
Mott Iron Works, J. L. 76

National Pipe & Foundry Co. 17
National Water Main Cleaning Co. 18
Neptune Meter Co. 10-11
Newport Culvert Co. 104

N.Y. Contin'l Jewell Filtration Co. 5[illegible]
Noiseless Typewriter Co. .... 3[illegible]
Noll Bros. .... 8[illegible]
Norwood Engineering Co. .... 2[illegible]
Nutter, Frank H. .... 9[illegible]

Otterson Auto-Eductor Co. .... 6[illegible]

Packard Motor Car Co. .... 6[illegible]
Pennsylvania Cement Co. .... 10[illegible]
Penn. Lawn Mower Works .... 11[illegible]
Pennsylvania Salt Mfg. Co. .... 2[illegible]
Pioneer Asphalt Co. .... 39-10[illegible]
Pitometer Co. .... 6[illegible]
Pittsburgh Filter Mfg. Co. .... 4[illegible]
Pittsburgh Meter Co. .... 2[illegible]
Pollock & Taber .... 9[illegible]
Potter, Alexander .... 9[illegible]
Potts, Clyde .... 9[illegible]
Pratt & Cady Co., Inc. .... 23-5[illegible]
Puro Sanitary Drinking Foun. Co. 8[illegible]

Reading Foundry & Supply Co. .. 1[illegible]
Rensselaer Valve Co. .... 2[illegible]
Republic Creosoting Co. .... 9[illegible]
Republic Rubber Corporation .... 6[illegible]
Rigamount, Victor A. .... 9[illegible]
Rochester Can Co. .... 8[illegible]
Rundle-Spence Mfg. Co. .... 8[illegible]
Russell Grader Mfg. Co. .... 10[illegible]

Salem Brass & Iron Mfg. Co. .... 1[illegible]
Sanitary Co. of America .... 1[illegible]
Scofield Engineering Co. .... 9[illegible]
Semet-Solvay Co. .... 10[illegible]
S. E. T. Valve & Hydrant Co. .. 2[illegible]
Sewer Pipe Mfrs. Assn. .... 15-4[illegible]
Shawnee Mower Co. .... 9[illegible]
Sherman, LeRoy K. .... 9[illegible]
Shone Co. .... 2[illegible]
Simplex Wire & Cable Co. .... 8[illegible]
Smith Co., A. P. .... 2[illegible]
Smith Co., W. & T. .... 9[illegible]
Somerville Iron Works, The .... 1[illegible]
Sonneborn Sons, Inc., L. .... 86-8[illegible]
South Bend Motor Car Works .. 6[illegible]
Southern Clay Mfg. Co. .... 10[illegible]
Spaulding Mfg. Co. .... 10[illegible]
Spray Engineering Co. .... 4[illegible]
Standard Foundry Co. .... 1[illegible]
Standard Oil Co. .... 11[illegible]
Stander, Louis E. .... 9[illegible]
Stewart Iron Works Co. .... 9[illegible]
Storms Mfg. Co. .... 10[illegible]
Storrs & Harrison Co. .... 9[illegible]
Superior Mfg. Co. .... 1[illegible]

Taylor, Henry W. .... 9[illegible]
Taylor Portable Steel Derrick Co. 10[illegible]
Thomson Meter Co. .... 2[illegible]
Thorburn & Co., J. M. .... 9[illegible]
Truscon Steel Co. .... 10[illegible]
Turbine Sewer Mch. Co. .... 2[illegible]
Twogood, L. Scott .... 9[illegible]

Union Foundry Co. .... 1[illegible]
Union Iron Products Co. .... 5[illegible]
Union Water Meter Co. .... 2[illegible]
United Lead Co. .... 2[illegible]
U. S. Cast Iron Pipe & Fdy. Co. .. 3-4[illegible]
United States Tire Co. .... 7[illegible]
Universal Road Machinery Co. .. 10[illegible]

Waddell & Son .... 9[illegible]
Wallace & Tiernan Co., Inc. .... 1[illegible]
Warren Engineering Co. .... 9[illegible]
Warren Bros. Co. .... 10[illegible]
Warren Foundry & Machine Co. 2[illegible]
Washtenaw Engineering Co. .... 9[illegible]
Water Works Equipment Co. .... 2[illegible]
Watson Wagon Co. .... 11[illegible]
Weiskittel & Son Co., A. .... 1[illegible]
Westinghouse Elec. & Mfg. Co. .. 1[illegible]
Wetter Mfg. Co., H. .... 1[illegible]
White Co., The .... 5[illegible]
Wiley & Sons, John .... 3[illegible]
Wolff, Mark .... 9[illegible]
Wood & Co., R. D. .... 2[illegible]
Worthington Pump & Mch. Corp. 1[illegible]
Wright Wire Co. .... 8[illegible]

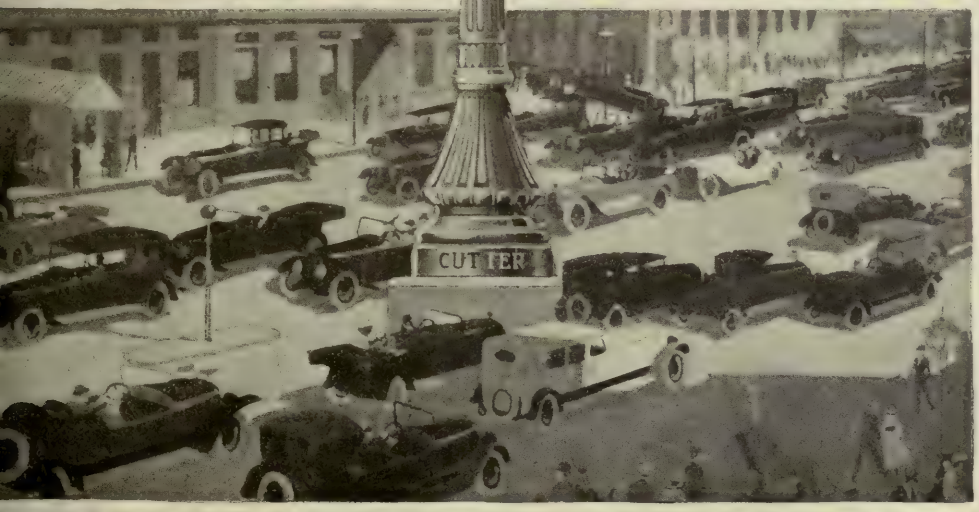
Zelnicker Supply Co., W. A. .... 2[illegible]

TRAFFIC PROBLEMS SOLVED

Traffic tangles are solved instantly by means of the Cutter Traffic Post.

The Cutter Post is a substantial ornamental standard, with a ruby red globe that stands out in the darkest night as a warning to all who drive. It instantly commands attention and enforces the familiar but oft unheeded rule "Keep to the right." It not only helps to expedite traffic but also adds to the appearance of streets.

Write for catalog describing in detail Cutter Traffic Posts, Ornamental Lighting Standards and outdoor and indoor lighting fixtures.



GEORGE CUTTER COMPANY.
813 NOTRE DAME ST. SOUTH BEND, IND.

Now, A FISK TIRE

for every motor vehicle that rolls

TRANSPORTATION, the nation's vital present day need, looks to the motor truck to help solve its problem.

Tires of brutal strength are demanded to carry without delays merchandise that *must* be delivered on time.

The Fisk Solid Truck Tire is built to meet this demand. It is a tire built to perform the hardest and heaviest work that solid are called on to withstand.

Here is a tire that must be r oned with, and users of m trucks must look at it squarel

Made by a company wit nation-wide branch distribu and an established reputation quality and fairness.

To be the best concern in the world *to work for*, and the squarest concern in the world *to do business with*—THE FISK IDEA

FISK SOLID TIRES

The American City

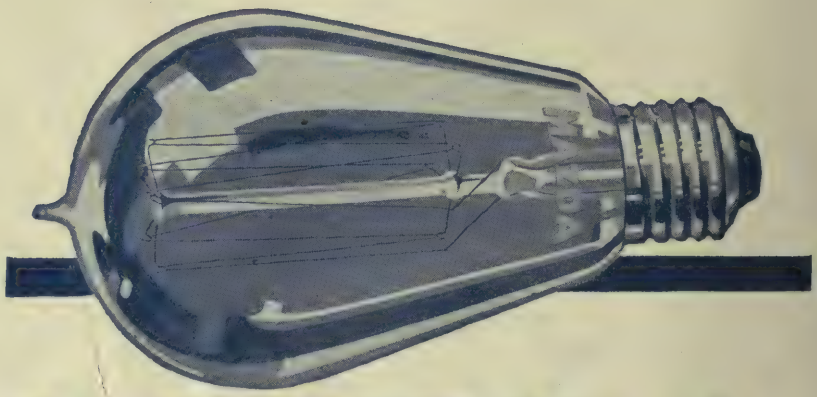
May, 1918
35 Cents $3 a Year

Publication Office:
Tribune Building, New York

PUBLIC UNIVERSITY LIBRARY

LIVING FLAG OF BLUEJACKETS—THE LIBERTY FLAG OF THE

hotographed at the United States Naval Training Station, Great Lakes, Ill. The flag in
more than seven acres. An article on the water supply and sanitation of this trainin
0 of this issue and is followed by details regarding the taking of this remarkabl



MAZDA

"Not the name of a thing, but the mark of a service"

MAZDA Service—a systematic research for making good lamps better

The Meaning of MAZDA

MAZDA is the trademark of a world-wide service to certain lamp manufacturers. Its purpose is to collect and select scientific and practical information concerning progress and developments in the art of incandescent lamp manufacturing and to distribute this information to the companies entitled to receive this Service. MAZDA Service is centered in the Research Laboratories of the General Electric Company at Schenectady.

The mark MAZDA can appear only on lamps which meet the standards of MAZDA Service. It is thus an assurance of quality. This trademark is the property of the General Electric Company.

RESEARCH LABORATORIES OF
GENERAL ELECTRIC COMPANY

The Triumph of the Bell-and-Spigot Joint

Thirty thousand feet—2500 bell and spigot joints -of U. S. Cast Iron Pipe—laid over rough country—ranite boulders—sharp dips of from 12 to 20 feet nder water—and all without a special casting or a end of any kind.

Such is the latest story of Cast Iron Pipe efficiency -*and the efficiency of the good old fashioned bell and pigot joint.*

We can't cover this big story in one ad.—watch ır picture details. But—get this NOW—there ere 2500 joints, and out of all that multitude, only showed slight signs of leakage when the line was sted.

At one point the line dipped through a lake—opped 20 feet under water,—then rose to the ore on the other side. The lake was narrow,—e'll show you a picture of that later—so you can agine the tremendous strain to which those joints ere subjected. With that in mind just recall that ly 3 joints out of 2500 showed even a slight leak. ome 2497 joints *perfect*, in spite of the rocky-road--Dublin conditions almost everywhere.

Where was it? Medicine Canyon, Okla. What pe was it? The pipe with 250 years service cord back of it—

24-INCH LINE LOOKING SOUTH FROM DAM THROUGH MEDICINE CANYON

UNITED STATES CAST IRON PIPE AND FOUNDRY COMPANY

700 E. Pearl St., BURLINGTON, N.J.

SALES OFFICES

Philadelphia, 1421 Chestnut St.
Pittsburgh, Henry W. Oliver Bldg.
New York, 71 Broadway.
Chicago, 122 So. Mich. Blvd.
Cleveland, Ohio, 1150 E. 26th St.
St. Louis, Security Bldg.
Birmingham, Ala., Amer.Tr. Bldg.
San Francisco, Monadnock Bldg
Buffalo, 957 E. Ferry St.
Minneapolis, Plymouth Bldg.

U. S. CAST IRON PIPE

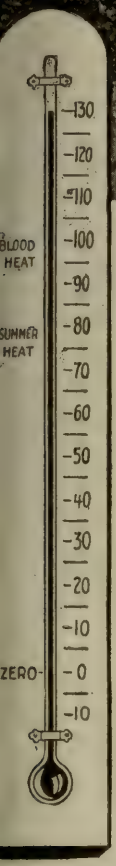
"THE PIPE THAT OUTLASTS THE AGES"

For Index to Advertisements see Page 112
For Classified List of Advertisers see Page 102

130° above zero

The same road
The same smoot
surface, kept s
year after yea
by

10° below zero



Buckling from summer expansion Cracking from winter contraction

are both prevented by

CAREY Elastite

NAME REG. U.S. Patent Office

EXPANSION JOINT

ELASTITE, always elastic and always tight, is able to absorb all road expansion and contraction due to extreme temperatures because it is made of flexible asphalt compound.

This tempered compound sandwiched between two layers of saturated asphalt felt, will compress without melting or running away in the hottest weather.

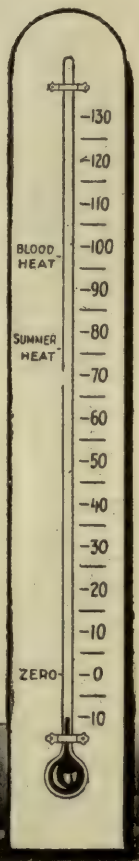
It will adhere to the paving and stretch without cracking in the coldest winter temperatures.

Better yet it retains this elasticity year after year, and at the same time withstands the wear of traffic as successfully as the street itself.

It comes to the job in strips of the length, depth and thickness desired and is placed by one man without holding up the work of the paving gang.

ELASTITE is economical to install, ideal in service, and is a demonstrated success on the Dixie Highway, Lincoln Highway and many of America's most famous streets and boulevards. For descriptive literature and sample write

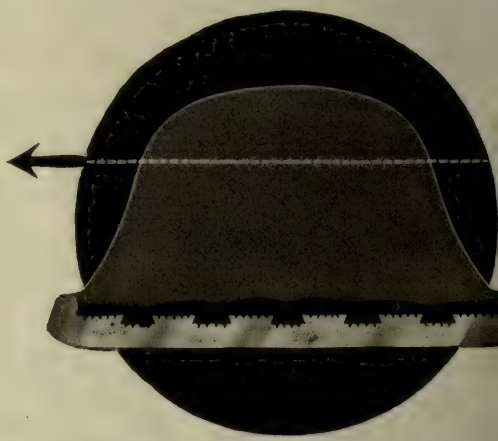
THE PHILIP CAREY CO.
8 Wayne Ave., Lockland Cincinnati, Ohio



DE LUXE
TIRES FOR DEFENSE

Extra Tread Rubber—

Your Guarantee of Uninterrupted Service



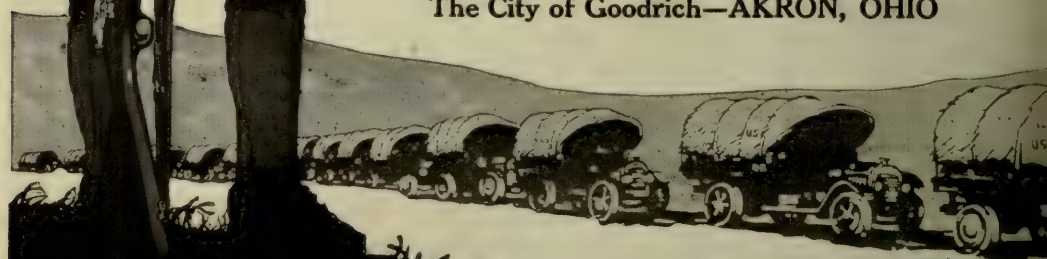
WHAT the soldier is to the nation De Luxe Truck Tires are to your truck—defense.

Their *thicker, more-wear-resisting tread* defends the truck better against the destructive forces of road shock and vibration than do the *thinner* cushions of other makes.

This greater protection to you, Mr. Truck Owner, means less depreciation, greater carrying capacity, longer mileage, lower power bills and *lowest operating cost per mile.*

THE B.F. GOODRICH RUBBER COMPANY

The City of Goodrich—AKRON, OHIO



MADE ONLY BY

GOODRICH

Reduce Risks

MANY Hose buyers unknowingly take big chances when they buy Fire Hose mainly by test of jacket strength. The heart of the hose is the inner tube. If the heart is bad the body is bad.

GOODRICH "White King" Fire Hose has an inner tube of unsurpassed endurance. It is elastic, tough and age-resisting. It withstands heavy pressure longer without buckling, and permits many foldings. It will not weaken under excessive bending. It will not crack and will not burst when property and lives hang in the balance.

These are some of the reasons why "White King" holds its own with any other Fire Hose on the market. Specify it on your next buy.

THE B.F. GOODRICH RUBBER COMPANY

Makers of the Celebrated Goodrich Automobile Tires—
"Best in the Long Run"

The City of Goodrich

AKRON, OHIO

W. S. S.

A Purchased Thrift Stamp is a Soldier's Life Insurance Policy

On Sale at all Goodrich Branches

GOODRICH
"WHITE KING"
FIRE HOSE

EVERWEAR

BOYS WILL BE BOYS
GIRLS WILL BE GIRLS

It makes little difference whether they are boys or girls—all children have that desire to play and exercise. So why not let them carry on their joyful and innocent games in a safe and systematic manner. And in no better way can this be done than through the means of playgrounds.

Playgrounds make healthier and happier children and consequently healthier and happier men and women.

Let us have data on your ground spaces and we will gladly send you plans and prices without you incurring any obligation.

THE EVERWEAR MANUFACTURING CO.

Springfield, Ohio

EVERWEAR
STANDS WEAR AND TEAR

EQUIPMENT

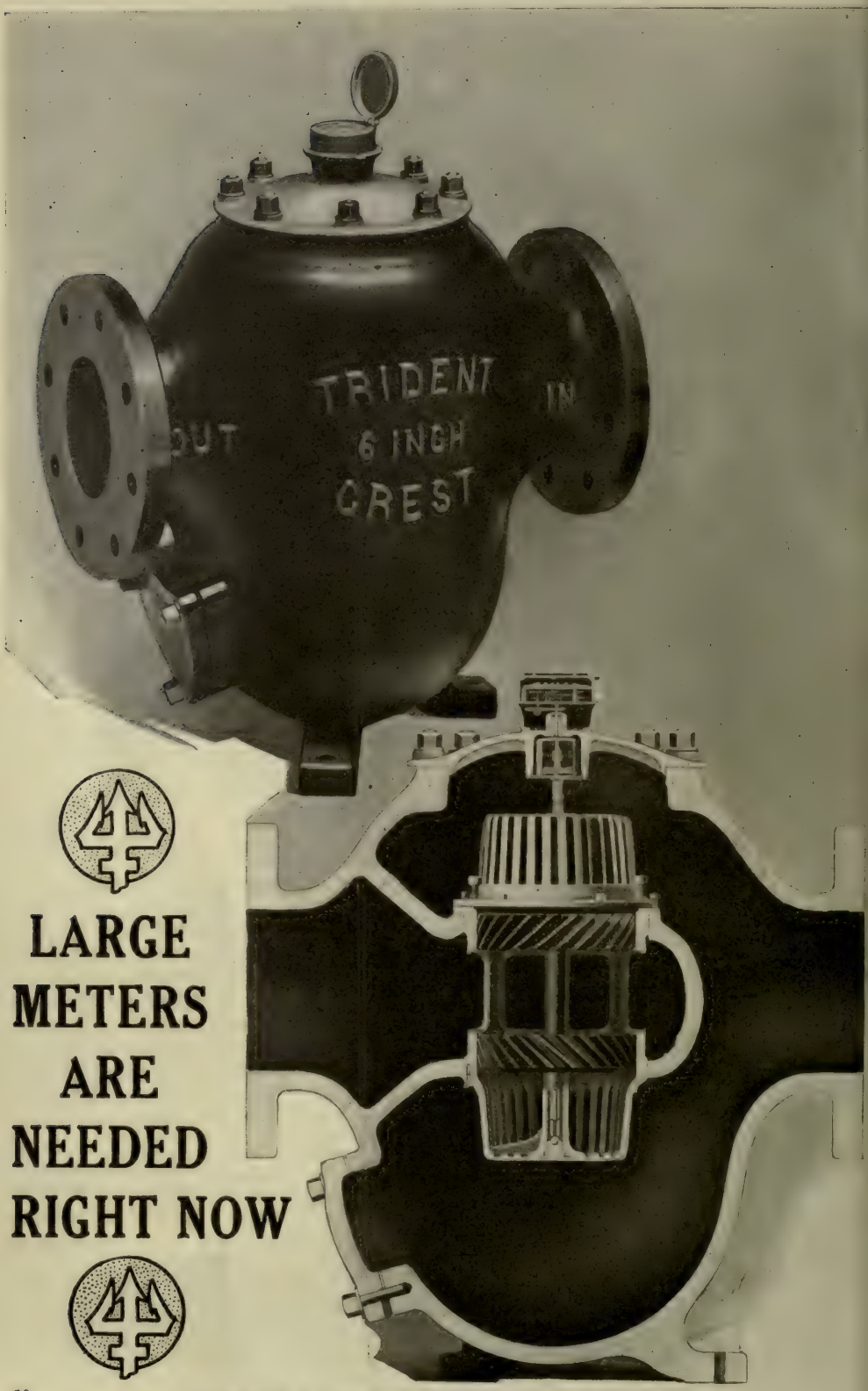
WHY YOU SHOULD USE EVERWEAR APPARATUS!

The *children are safe* on Everwear apparatus, because every detail of construction is planned to safeguard them. And *you are safe* in purchasing Everwear because it is built of the highest grade materials and by expert workmen. For durability it has no peer. All equipment is carefully inspected and tested and shipped *direct* from *maker* to *user*. Equipment at a minimum cost embodying maximum efficiency.

Write for free catalog describing and picturing our complete line of the latest and approved playground equipment. And don't forget—*More Playgrounds make fewer Plaguegrounds.*

THE EVERWEAR MANUFACTURING CO.
Springfield, Ohio

EVERWEAR
STANDS WEAR AND TEAR



LARGE METERS ARE NEEDED RIGHT NOW

When writing to Advertisers please mention THE AMERICAN CITY.

Large Meters Are War Time Necessities

The larger sizes of Trident Disk Meters, Trident Crest Meters, Trident Compound Meters, Trident Protectus Meters may be had on short notice.

You need these meters. Your larger, more important services should be metered—and metered efficiently.

We might mention a town where a new service was hurriedly put in to answer an urgent need—there were no large meters on hand for installation, and the water company suffered an annoying water-loss for months. Then the line was metered.

There are instances where private fire-lines and sprinkler services, left unmetered, have been illegally used for industrial purposes. There is the case of the cities where new ship-building plants are consuming so much water that a serious shortage is imminent. And there are hundreds of other cases.

You know conditions in your own water department. Are there not many services where large size meters would result in a great saving of wasted pumping energy? Is this a time to tolerate waste of good coal and the unnecessary wear and tear of valuable pumping machinery?

If interested in receiving our free booklets on meters and the prevention of water waste in your city, let us have your address.

NEPTUNE METER COMPANY

50 EAST 42nd STREET, NEW YORK

CHICAGO · BOSTON · SANFRANCISCO
ATLANTA · LOS ANGELES · PORTLAND · SEATTLE
CINCINNATI

They did it this way in the 17th Century

And during the Centuries

Cast Iron

has made a wonderful record in

It has demonstrated there *is* a pipe that *lasts*.

That there *is* a pipe from which the rust-resisting elements are not removed in the refining process.

That there *is* a pipe with a Perfect Service Record.

We do it this way today

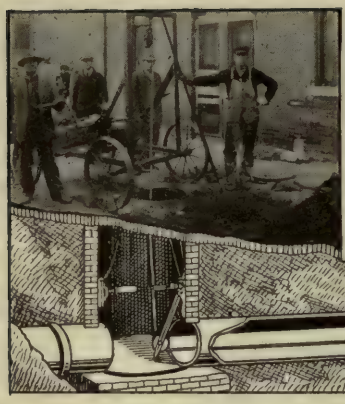
hich have elapsed

Pipe

lunicipal Service

The Cast Iron Pipe Publicity Bureau

1 Broadway, New York



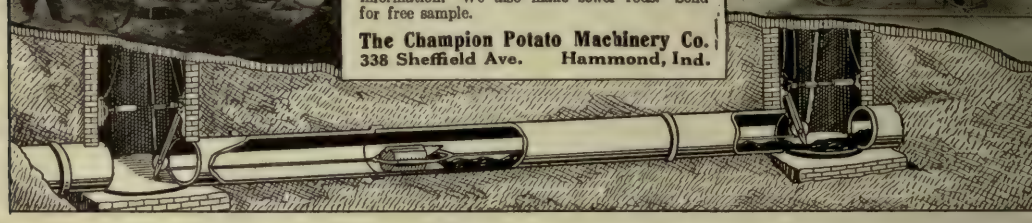
SEWER CLEANING MACHINERY

The Kuhlman Sewer Cleaning Apparatus will clear any sewer of dirt, gravel, sand, cinders, rags, paper, tar or practically anything.

It does the work quickly and cheaply. It's a great time and money saver. It is being utilized by scores of progressive municipalities all over the country.

Write at once for prices and other interesting information. We also make sewer rods. Send for free sample.

The Champion Potato Machinery Co.
338 Sheffield Ave. Hammond, Ind.



TO the USERS of the "RENSSELAER" IMPROVED "COREY" FIRE HYDRANTS

SEND FOR NEW HYDRANT BULLETIN "A"

RENSSELAER VALVE CO. TROY, N. Y.

OZONE

The Most Powerful Germicide and Oxidizing Agent Known to Science

PURIFIES WATER

by destroying

ODORS, TASTES and BACTERIA

THE IDEAL AND PERFECT
ELECTRIC OZONE SYSTEM CHICAGO U.S.A.
PURIFIER OF WATER

Harmless, Inexpensive, Effective

Mr. Geo. A. Soper in Engineering News, Vol. 42, page 250, says, "The claims made for the ozone treatment of water are as distinct and its functions as clearly defined as are those of filtration and sedimentation. Ozonation aims to eliminate bacteria from water and to destroy unpleasant colors and odors of vegetable origin. It is especially valuable in removing unpleasant odors."

We furnish ozone systems for cities, institutions, etc.

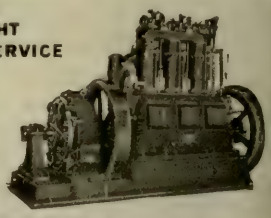
Electric Ozone Sterilizer Co.
53 W. Jackson Blvd., Chicago, Illinois

THE FOOS

WATERWORKS
ELECTRIC LIGHT
and POWER SERVICE

Fuels
Producer Gas
Natural Gas
Kerosene

Sizes
6 to 325 hp.



Manufacturers of CAST IRON PIPE

for WATER—GAS—CULVERTS—SEWERS

Special Castings:-Also Flexible Joint Pipe-Cylinders-Tubes, Milled and Plain Ends-High Pressure Fire Service Pipe.

"Quality and Service Guaranteed"

WARREN FOUNDRY & MACHINE CO

Sales Offices: 11 Broadway, N.Y. / 201 Devonshire St., Boston, Mass.
Works: Phillipsburg, N. J.

WHY

WHY does New York City protect all its water supplies with Liquid Chlorine and W & T equipment?

WHY was W & T equipment specified for the new Catskill Aqueduct?

WHY is W & T equipment used at cantonments?

WHY are over 500 cities and towns in this country using W & T equipment to protect their water supplies?

WHY is W & T equipment always specified when absolute protection of water supplies is required?

Because

W & T equipment is the STANDARD apparatus for the control and application of Liquid Chlorine—the 100% sterilizing agent.

It has no moving parts—Meters hydraulic in principle—Absolute accuracy of control—You can see the Chlorine flowing.

No matter from what source a water supply may be obtained, the only way to make it absolutely safe is to sterilize it.

The most efficient and economical sterilizing agent is Liquid Chlorine, and W & T equipment—the STANDARD CHLORINATOR—is as essential for sterilization as the Chlorine itself.

Send for Booklet "WHY" with full information.

Wallace & Tiernan, Co., Inc.

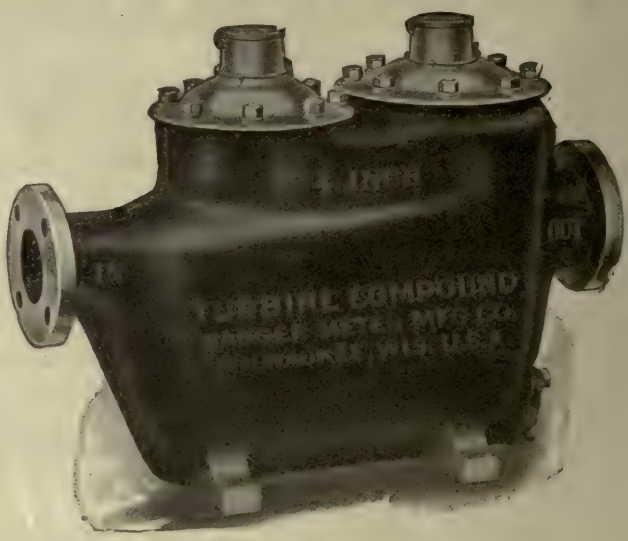
137 Centre Street, New York

CHICAGO OFFICE: Peoples' Gas Building.

Canadian Representatives: The General Supply Co. of Canada, Ottawa, Montreal, Toronto, Winnipeg.

Pacific Coast Representative: Kenneth Shibley, Merchants Exchange Building, San Francisco, Cal.

The Meter that gives absolute satisfaction is the BADGER



THE BADGER

Gives Most Service and Least Trouble

The water meter that will keep accurate records and give the most service with little trouble and maintenance expense is the Badger Meter.

Perfect workmanship and excellent finish are characteristic of all Badger Meters.

Every Badger Meter is carefully tested by actual operation before it is sent forth with our binding guarantee for accuracy.

No test is considered satisfactory until the meter has properly recorded on both large and small flows.

Upon receipt of your name and address, a neat little booklet on water meters will be sent you free.

The Badger Meter Mfg. Co.
MILWAUKEE, WIS.

WORTHINGTON

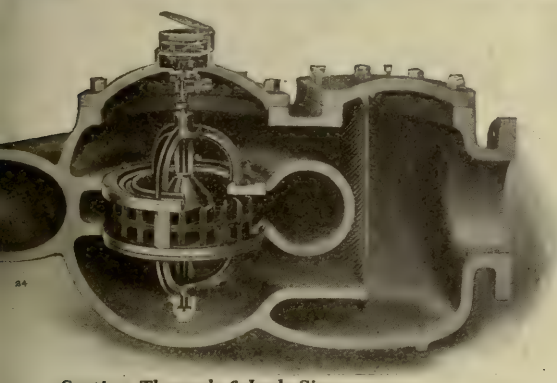
big line to choose from—a safe line to choose

rthington Model "G" Water Meter

METERS

Stop waste of water

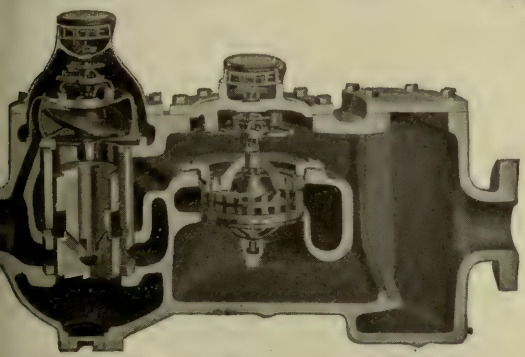
To use water carefully and economically in times of peace is wisdom—in war time—now, it is a national necessity. Stop the waste and you stop unnecessary pumping, the waste of steam, labor, coal, handling and transportation, releasing men and material that the government needs.



Section Through 6-Inch Size
Worthington Turbine Water Meter

WORTHINGTON PUMP AND MACHINERY CORPORATION

NEW YORK OFFICE: 115 BROADWAY
WORKS: HARRISON, N. J.
Branch Offices in All Principal Cities I 68.8



Worthington Compound Water Meter

METERS
DEEP WELL PUMPS
CENTRIFUGAL AND DIRECT-ACTING WATER WORKS PUMPS

WATER WORKS EQUIPMENT

A QUESTION OF DOLLARS & CENTS

Public Officials Are Cutting Expenses

wherever possible. This tendency to economize is especially evident in the water works dept. Water works men are adopting every means to curtail water waste and prevent unnecessary expenditures.

One practical way to effect a large saving is to have clean water mains. Every one knows that a clogged main necessitates a stronger pressure—because the incrustations retard the flow of water.

Most cities have found that

The National Method

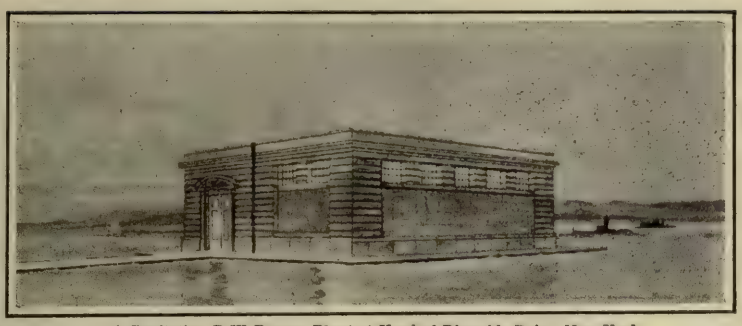
of cleaning mains is the simplest, quickest and cheapest. The mains are "cleaned and scoured" and restored to their normal capacity. Scores of cities have had and are having their mains cleaned in order that they may get a stronger pressure and effect a saving running into thousands of dollars annually.

Write for free book "The Cleaning of a Water Main." It shows you how to cut down your coal bill.

National Water Main Cleaning Co.

Hudson Terminal Building

NEW YORK CITY



A Sanitation R-W Process Plant at Head of Riverside Drive, New York

ANITATION R-W PROCESS SEWAGE TREATMENT PLANT AT RIVERSIDE DRIVE, NEW YORK

The Sanitation R-W Process permits the establishment of sewage treatment plants various convenient locations within the city limits without detriment to residential other sections, or existing or future improvements, because the effluent from screen is scharged directly into local water without nuisance or objectional effect.

A Sanitation R-W Process Plant is stationed at the head of New York's most shionable avenue—Riverside Drive—without any inconvenience or annoyance.

The Sanitation R-W Process may be advantageously, effectively and economically ed in the following ways:

1—For independent treatment; effluent discharging direct into public waters.
2—For clarification before disinfection.
3—For clarification before purification.
4—For screening before activated sludge treatment.
5—For preliminary treatment before digesting tanks to remove non-digesting and slow-digesting matters.
6—For preliminary treatment before tanks to prevent clogging or stoppage in tanks, piping, valves, etc.
7—As auxiliary apparatus with tanks, basins, and existing plants to afford increased working capacity.
8—As protection to sprinkling filters.
9—For protection to pumping machinery.
10—For treatment of trade wastes and the recovery of values and the clarification of waste liquors.
11—For preliminary treatment of domestic water supply.
12—For treatment of industrial water supply for condenser and sanitary uses.

Installations are now being made in Santa Barbara, California, and Plainfield, New Jersey.

Write for illustrated booklet. It explains the Process in detail, with photographs and diagrams.

The Sanitation Corporation

50 Church Street New York City

THEY DIDN'T KNOW IT

BUT A PITOMETER SURVEY DISCOVERED THIS

And many more—all underground too, the kind that could not be seen on the surface. This city is now saving thousands of dollars in fuel alone.

Why permit water waste in your city when it can be stopped?

Write for our free literature.

The Pitometer Co., 55 Duane St., New York

KEEP YOUR METER OUT OF THE REPAIR SHOP

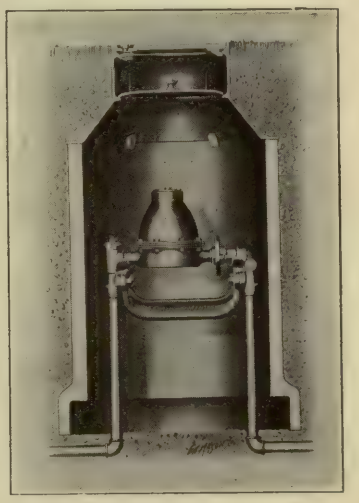
FORD METER BOXES will help to keep your meters out of the repair shop by protecting and safeguarding the delicate mechanism from the destroying hands of Jack Frost and human meddlers.

Ford-Boxed meters can't freeze because they are protected by earth's heat and an air-tight cover.

Ford Meter Box Covers come off only for the meter readers, thereby putting an end to the "not-at-home" delayed readings.

Ford Meter Boxes mean ABSOLUTE PROTECTION—nothing more—nothing less.

Let us send you circular matter telling you more about the Ford Meter Box and how it can save your water department some real money.



THE FORD METER BOX CO.
WABASH, INDIANA

CHAPMAN VALVES
and
ACCESSORIES

Everything for Water Works and Sewage Disposal but the Pipe.

Corporation and Curb Cocks.

Goosenecks—made up with Anderson couplings which eliminate wiped joints.

Gate Valves
Sluice Gates
Hydrants

Catalogue containing valuable information free on request.

Write Today

THE CHAPMAN VALVE MFG. CO.
Indian Orchard, Mass.

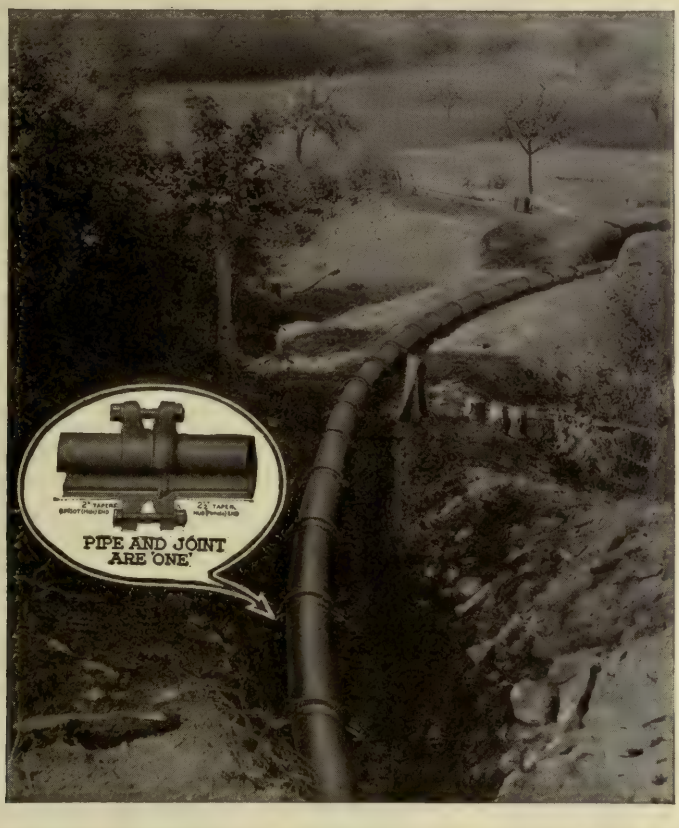
UNIVERSAL PIPE

FOR EVERY SERVICE

Can be laid anywhere—at any time—under any conditions

Wrenches the Only Equipment

—no packing
—no calking
—no gaskets



Tested and Approved for Fire Protection Service by The National Board of Fire Underwriters

12″ LINE OF UNIVERSAL STANDARD 6 FT. LENGTHS LAID ON 108 FOOT RADIUS AT JUNIATA, PA.

The JOINT and the PIPE are CAST IRON. Direct CONTACT of the MACHINED HUB AND SPIGOT ENDS forms LEAK-PROOF JOINTS, flexible under working pressure.

CORRESPONDENCE INVITED.

CENTRAL FOUNDRY COMPANY

CHICAGO
DALLAS

NEW YORK
90 West Street

ATLANTA
SAN FRANCISCO

U-258

GREAT WESTERN ELECTRO CHEM CO.
BUSH, BEACH & GENT
SOLE AGENTS
CARBON TETRACHLORIDE
POTASSIUM CHLORATE
BLEACHING POWDER
LIQUID CHLORINE
CAUSTIC SODA
SAN FRANCISCO, CAL.

A Contract is a Contract

80 Maiden Lane
NEW YORK

Holbrook Building
SAN FRANCISCO

LIQUID CHLORINE

CHLORIDE OF LIME
(Bleaching Powder)

—SODA ASH—

LYNCHBURG FOUNDRY COMPANY

Bell and Spigot and Flanged

GENERAL SALES OFFICE: Peoples Gas Building, CHICAGO, ILL.

AMERICAN CAST IRON PIPE CO.

MANUFACTURERS OF

BIRMINGHAM, ALA.

SALES OFFICES
Birmingham, Ala., Box 908
Columbus, Ohio, 607 New Hayden Bldg.
Minneapolis, Minn., 712 Plymouth Bldg.
New York City, No. 1 Broadway
Chicago, Ill., 512 1st National Bank Bldg.
Dallas, Tex., 1217 Praetorian Bldg.
Kansas City, Mo., 716 Scarritt Bldg.
San Francisco, Cal., 711 Balboa Bldg.

P&C CO

VALVES & HYDRANTS

P&C CO

of UNUSUAL QUALITY — for UNUSUAL SERVICE

Pratt & Cady Co., Inc. Write for Catalogue Hartford, Conn.

WM. E. DEE COMPANY
80 N. La Salle Street Chicago, Ill.

We manufacture Manhole, Catch Basin and Sewerage Castings of all Kinds. We make anything in Gray Iron. Write for our prices.

CAST IRON SOIL PIPE

LASTS LONGER THAN THE BUILDING—*ANY BUILDING*

THE PIPE EVER-LASTING

A NEW BUSINESS HOME—Built to last—To afford permanent service—To have ideal sanitary conditions.

CAST IRON SOIL PIPE installed,—knowing it will outlast the building. Used throughout to insure permanent service. Specified to prevent unsanitary conditions.

SANITATION, ECONOMY, PERMANENT SERVICE

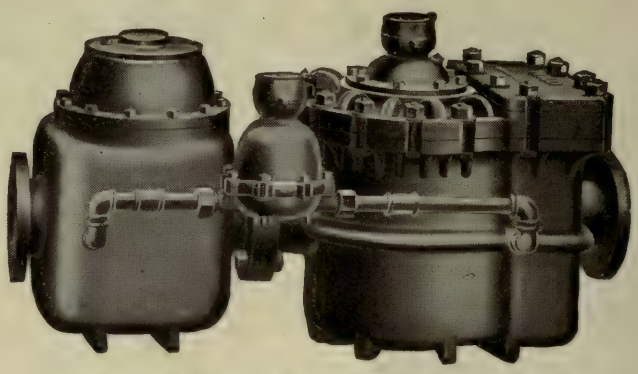
IN THE BUILDING UNDER THE GROUND

Madison Ave. & 40 St., New York
Starrett & Van Vleck *Architects*

Specifications and literature will be mailed upon request by any or all of the following independent and competing makers of Cast Iron Soil Pipe and Fittings

Weiskittel & Son Co., A.	Baltimore, Md.	Campbell Mfg. Co.	Gadsden, Ala.	Haines, Jones & Cadbury Co.	Philadelphia, Pa.	Salem Brass & Iron Mfg. Co.	Salem, N. J.
Wetter Mfg. Co., H.	Memphis, Tenn.	Casey-Hedges Co., The	Chattanooga, Tenn.	Johnson Co., J. D.	New York, N. Y.	Sanitary Co. of America	Linfield, Pa.
Abendroth Brothers	Port Chester, N. Y.	Central Foundry Co.	New York, N. Y.	Kropp Foundry Co.	Lansdale, Pa.	Somerville Iron Works	New York, N. Y.
Alabama Pipe & Foundry Co.	Anniston, Ala.	Charlotte Pipe & Foundry Co.	Charlotte, N. C.	Medina Foundry Co.	Medina, N. Y.	Standard Foundry Co.	Anniston, Ala.
American Foundry & Pipe Co.	Penn's Sta., Pa.	Coosa Pipe & Foundry Co.	Birmingham, Ala.	National Foundry Co. of N. Y., Inc.	Brooklyn, N. Y.	Superior Mfg. Co.	Bessemer, Ala.
Anniston Foundry Co.	Anniston, Ala.	Crown Pipe & Foundry Co.	Jackson, Ohio	National Pipe & Foundry Co.	Attalla, Ala.	Union Foundry Co.	Anniston, Ala.
Bessemer Soil Pipe Co.	Bessemer, Ala.	Gadsden Pipe Co.	Gadsden, Ala.	Reading Foundry & Supply Co.	Reading, Pa.		

A-1041



COMPOUNDING VALVE ATTACHED TO NILO METER

The Union Compounding Valve Registers the Trickle as Well as the Rush

Simply take the valve and the small meter and attach them to any large meter, and you have an accurate and simple compound meter at a remarkably low cost.

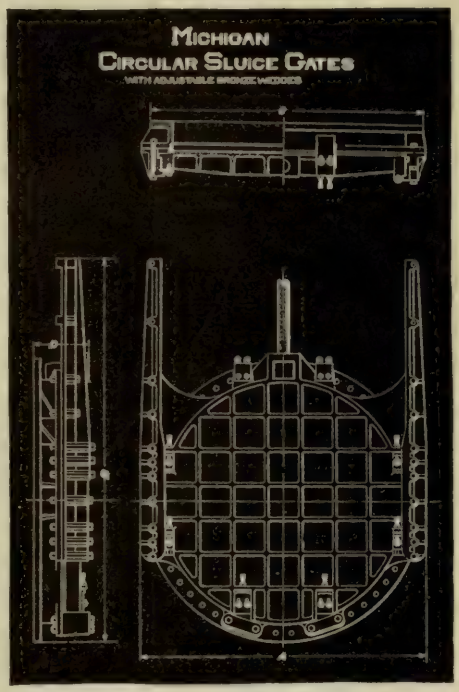
Write for interesting data on the subject of Water Meters.

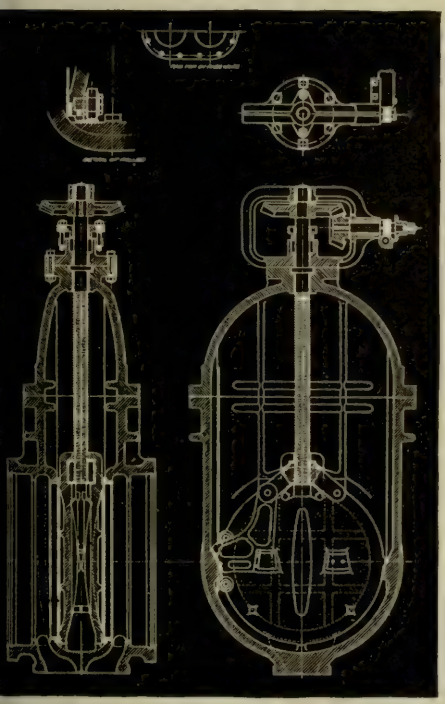
UNION WATER METER COMPANY
WORCESTER, MASSACHUSETTS

MICHIGAN

ORIGINATORS

We are the original inventors of the "Michi-an" valve that has been adopted by St. Louis nd New York and used by most of the larger ities in the United States, including Louisville, Minneapolis, St. Paul, Duluth, Toledo, Colum-us, New Orleans, Detroit, New York, Baltimore nd Washington. Away back in 1870 we secured ur patents for releasing the wedge mechanism efore the discs begin to operate. St. Louis as in use our Gate Valves up to sixty inch; and ur Sluice Gates up to 9′ x 11′ rectangular and 84″ ircular. We show cuts of the St. Louis gate nd sluice gate on this page. Like all good hings, our ideas on gate and valve mechanism ave been copied widely.





Deal With The Originators

It will pay you. For Flower-Stephens service and quality are in a class of their own; and imitators are always a few laps behind in catching up with our ideas. Many Michigan sluice gates have been in constant service since 1875. They have solved many difficult problems of size and adjustment that have puzzled municipal engineers. We also manufacture a full line of Water Works products, including Water Gates, Checks, Fire Hydrants, Indicator Posts, Sleeves and Valves and many other specialties for the convenience of the Water Works Superintendent.

Flower-Stephens Mfg. Co.
103 Parkinson St., Detroit, Michigan

HYDRANTS & VALVES

Mathews Fire Hydrants

A Recognized Standard

Made in Standard
and High Pressure Types

Frost-Proof—
Positively Automatically Drained—
Always Dependable

GATE VALVES
For All Purposes

CAST IRON PIPE
and
FITTINGS

"REDUCED" Fittings

R. D. WOOD & CO.

Philadelphia, Pa.

Write for Catalogues and Prices

Chemicals for Water Purification

We manufacture highest grade of

Sulphate of Alumina

also

Chloride of Lime

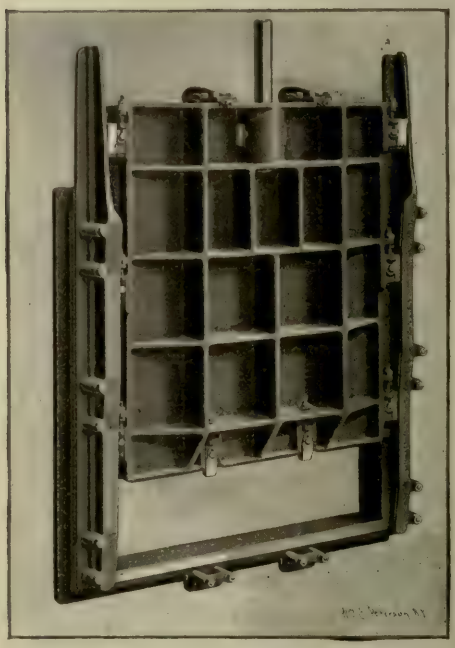
Liquid Chlorine

PENNSYLVANIA SALT MFG. CO.

WIDENER BLDG. :: :: PHILADELPHIA, PA.

No. 6 Double Pinion Roller Bearing Pedestal

Standard Square Sluice Gate with Back Pressure Wedges



MANUFACTURERS OF SLUICE, HEAD AND PENSTOCK GATES, FLAP AND SHEAR VALVES

COLDWELL-WILCOX CO.

Water Street **Newburgh, N. Y.**

or MUNICIPAL WATER WORKS SERVICE

Distributing Agencies for Deming Power Pumps:—

Chicago—
Henion & Hubbell

Pittsburgh—
Harris Pump & Supply Co.

New York City—
Ralph B. Carter Co.

Philadelphia—
The W. P. Dallett Co.

Boston—
Charles J. Jager Co.

Denver—
Hendrie & Bolthoff Manufacturing & Supply Co.

San Francisco—
Simonds Machinery Co.

Richmond—
Sydnor Pump & Well Co.

Buffalo—
Root Neal & Co.

Deming Pumps need no introduction to the experienced water works man. More than thirty-seven years ago we began the making of Pumps—and today they embrace the results of all these years of experience.

The Deming line includes pumps for every duty and for any power—belt driven, electric driven, gas or gasoline driven or water wheel driven. Durability, ease of operation and low cost of maintenance are characteristic of Deming Pumps.

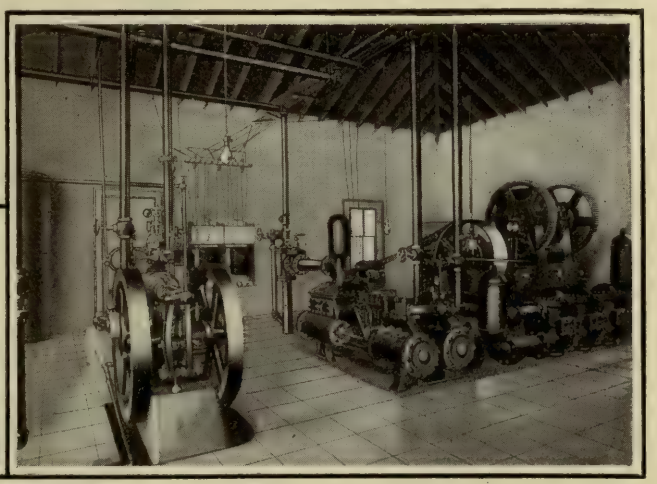
Write us about your requirements. Your inquiries will receive the prompt and careful attention of our Engineering Department.

THE DEMING CO.

SALEM, OHIO

Hand and Power Pumps for All Uses

DEMING



unicipal Waterworks, Power House and installation of Deming Pumps in a city of five thousand inhabitants.

**YOU INSURE YOUR LIFE—YOU INSURE YOUR HOME—
WHY NOT INSURE THE HEALTH OF YOUR CITIZENS?**

For 2 cents per year per capita you can insure the entire populace of your city against the ravages of typhoid fever and other water-borne diseases.

By treating your water supply with E. B. G. Liquid Chlorine you will gradually eliminate practically all danger of disease from this source.

Hundreds of cities are using Liquid Chlorine in their water works systems with wonderfully effective results, not only in the prevention of human suffering, but also from a cold dollar and cents point of view.

Write for our free book "The Wise Cities." It tells "Why and How."

Liquid EBG Chlorine

ELECTRO BLEACHING GAS Co.

16 East 41st Street
New York City

600,000,000
Gallons of
PURE WATER
is now supplied to 160 municipalities, and in no way can it be had more surely and at the same time so economically as by the use of
PITTSBURGH FILTERS

Pittsburgh Filter Installations

made in far off Manchuria and Uruguay, S. A., illustrate the spread of their name and fame. We design and build to meet individual conditions.

Write for illustrated matter.

PITTSBURGH FILTER MFG. COMPANY
PITTSBURGH, PA.
CHICAGO KANSAS CITY

APPROVAL

HERSEY DETECTOR METER

The Hersey Detector Meter has been accepted for eleven years in 3", 4", 6", 8", 10" and 12" sizes without any restrictions or conditions of any kind by every Insurance Company, Stock and Mutual, doing business in the United States, and by the Water Departments and Water Companies in more than 500 Cities and Towns for use on over 3,000 Fire Services protecting nearly $2,000,000,000 worth of Insured Property

HERSEY MANUFACTURING COMPANY

BOSTON — COLUMBUS, O. — SAN FRANCISCO
NEW YORK — PHILADELPHIA — LOS ANGELES
CHICAGO — ATLANTA — PORTLAND, ORE.

MATHIESON ALKALI WORKS, Inc

Niagara Falls, N. Y.

Castner Electrolytic Process

Eagle-Thistle Brand

CHLORIDE OF LIME

In 200, 450 and 750-lb. drums
Strongest, quickest-settling, most reliable.

LIQUID CHLORINE

Pure anhydrous, for use with any control apparatus. In improved and convenient cylinders, 105 and 150 lbs. net.

ARNOLD, HOFFMAN & CO., Inc

Sole Agents

Boston — 61 Broadway — Philadelphia
Providence — New York — Charlotte, N. C

ELIMINATE WASTE OF MONEY AND LABOR!!!

Every Water Meter frozen this past Winter called for an unnecessary expenditure of both. It is not enough to Conserve by simply installing Meters—they must be properly Housed.

"MODERN" METER HOUSINGS—Improved TOPS with Inner Lids and Simplified CONNECTIONS have proven their EFFICIENCY through actual Demonstration.

They Protect the Meter — eliminate loss through Service Leakage—are lowest in first cost—easiest to install and operate. If interested in more Efficient Meter Installations, send for samples or more detailed information.

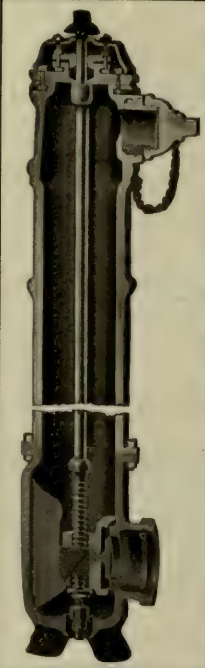
MODERN IRON WORKS

Manufacturers and Distributers

Improved Meter Housings and Connections—Service and Valve Boxes—Brass Goods—Pipe Derricks—Water Works Gages—Special Castings and other Water Works Supplies.

510 OHIO ST., QUINCY, ILL.

FIRE HYDRANTS



Frost-Proof
Simple-Efficien

All parts removable without digging up hydrant. Special device prevents street from being flooded should stand pipe be broken. Minimum expense to install and maintain.

LUDLOW

GATE VALVES

FOR

Water, Stean
Gas, Oil, Hydrauli
or Electric Operated

All styles, any size, all pressure

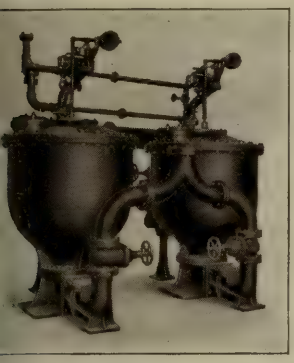
- - THE - -

Ludlow Valve Mfg. Co

TROY, N. Y.

Branch Offices

New York Chicago Boston
Philadelphia Pittsburg
Kansas City



SHONE EJECTORS

Have been used for handling sewage in municipal sewerage systems and city buildings in all parts of the world for over 35 years. Installation made in Chicago Auditorium in 1888 still giving perfect service.

Unequalled for reliability, economy and durability; absolutely non-clogging; no screens required; automatic and odorless.

SHONE COMPANY
225 Institute Pl., Chicago
Send for Bulletin P-4000

SLUICE GATES, CHECK VALVES, AIR VALVES, INDICATOR POSTS, ETC.

GATE VALVES **EDDY** **FIRE HYDRANTS**

Hydraulically and Electrically Operated Valves and Sluice Gates. Valves Designed For All Kinds of Service.

EDDY VALVE COMPANY, WATERFORD, N. Y.

New York Chicago Boston San Francisco Philadelphia

COLUMBIAN IRON WORKS

CHATTANOOGA, TENN.

Manufacturers of Fire Hydrants, Valves, Valve Boxes, Sluice Gates, Meter Boxes and Water Works Supplies

ESTIMATES PROMPTLY FURNISHED

Trade **LEADITE** *Mark*

Registered U. S. Patent Office

For Jointing Cast Iron Water Mains

NO CAULKING required

Saves 50% to 65%

Write for information and price

THE LEADITE COMPANY, Inc.

80 S. Broad Street Philadelphia, Pa.

The Best Material for CALKING Joints in Cast Iron Pipes is

Ulco Lead Wool

Write for particulars to

UNITED LEAD COMPANY
111 BROADWAY, N.Y. CITY

Statement of the Ownership, Management, Circulation, etc., Required by the Act of Congress of August 24, 1912, of The American City, Published Monthly at New York, N. Y., April 1, 1918.

State of New York, County of New York, ss.:

Before me, a Commissioner of Deeds, in and for the State and County aforesaid, personally appeared EDGAR J. BUTTENHEIM, who, having been duly sworn according to law, deposes and says that he is the Business Manager of THE AMERICAN CITY and that the following is, to the best of his kowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher	THE CIVIC PRESS, Inc.,	154 Nassau St., N.Y. C.
Editor	HAROLD S. BUTTENHEIM,	" "
Managing Editor	HAROLD S. BUTTENHEIM,	" "
Business Manager	EDGAR J. BUTTENHEIM,	" "

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock).

THE CIVIC PRESS (Incorporated) 154 Nassau St., N. Y. C.
Stockholders: HAROLD S. BUTTENHEIM, EDGAR J. BUTTENHEIM, HERBERT K. SAXE, JAMES H. VAN BUREN, 154 Nassau St., N. Y. C., MARY B. CASH, Madison, N. J.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for statements embracing affiant's full knowledge and beliefs as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

EDGAR J. BUTTENHEIM, Business Manager

Sworn to and subscribed before me this 19th day of March, 1918. HATTIE HEILBRUNN, Commissioner of Deeds.
New York County Clerk's No. 236
(My commisson expires June 27, 1918.

WRITE FOR LITERATURE BELOW

WRITE FOR TRIAL METER

WATER METER RATES AND REGULATIONS
ADVANTAGES OF USING WATER METERS
MODEL WATER METER SPECIFICATIONS
FACTS AND FIGURES ABOUT OUR METERS IN SERVICE
AMERICAN AND NIAGARA WATER METERS
WATER METER ACCESSORIES
SETTING AND TESTING WATER METERS
PRICE LIST WATER METERS AND ACCESSORIES

TRADE MINWAX MARK

THE PERMANENT
WATERPROOFING

Used on notable municipal works the country over. Send for the "Minwax" Bulletins describing waterproofing and protective products for every purpose.

THE MINWAX COMPANY, Inc.
18 EAST 41st STREET NEW YORK

PIVOT LOCK COVE

For Manholes Meter Boxes
Street Sweeping Receptacles

SAFE, ECONOMICAL and SANITARY
Write for details
THE EAST IRON AND MACHINE CO., Lima,

ORIGINAL
OF COURSE WE HAVE IMITATORS
YOU KNOW WHY—
the Clark Meter Box has *made good* in 25 years of actual service. Thousands of water departments use it. No other "*Just As Good*" Can't Be.
Prices are the lowest. Quick delivery. Other Clark Goods are in same class.

THE CLARK METER BOX
Trade Mark

H. W. CLARK CO.
130 So. 17th St., Mattoon, Ill.
Everything for the Water Works
New York Salt Lake City
San Francisco Chicago

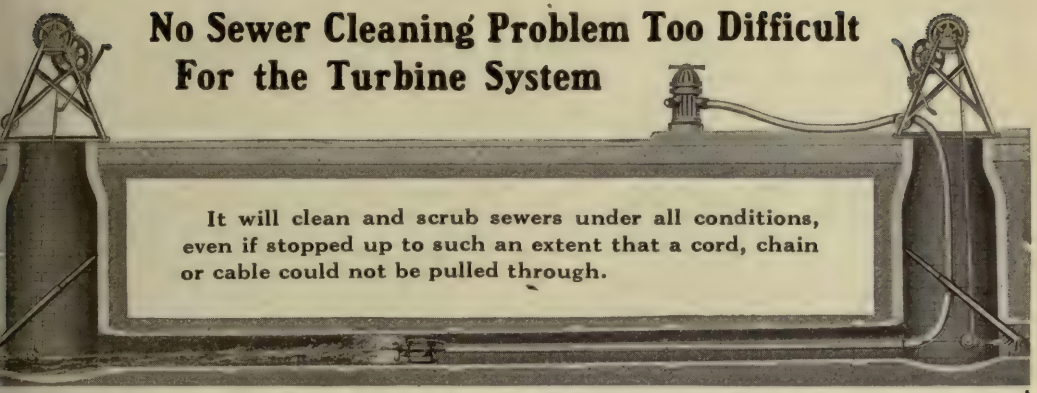
Cut that *Next* Job with a
STRICKLER
RATCHET PIPE CUTTER

You will be surprised at the speed. At the Smooth, Clean, Square Cut. No filing or reaming after the Automatic Strickler has done its work. Each size cuts a range of pipe sizes.

Catalog on request.

W. W. STRICKLER & BROS., Columbus, O

No Sewer Cleaning Problem Too Difficult For the Turbine System



In partially clogged sewers the **Turbine** is drawn through by means of cable and windlasses. If completely clogged, the **Turbine Forcing Jack** is used in forcing an opening through the stoppage. Roots, grease, tar and other resisting materials have been easily moved.

Write for "Sewer Cleaning Equipment"

Turbine Sewer-Machine Company
Incorporated
197 11th Street, Milwaukee, Wis.

"Let those now love who've never loved before,
And those who always loved now love the more."

LAMBERT WATER METERS

Long Life.

Lasting Accuracy.

All parts interchangeable.

Maintenance cost nominal.

Their merits have made meter systems popular. A good article is always worth the price. All improvements which the tests of time and long service show to be requisite in a **Perfect Water Meter** are embodied in the **Lambert.**

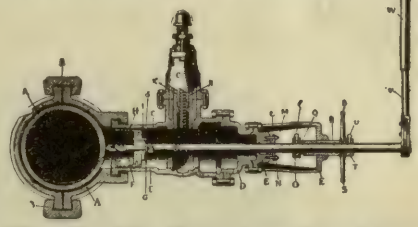
ONE MODEL ONLY

Made in all sizes, ⅝" to 6", of best bronze Composition throughout, fitted with Unbreakable reinforced disc-pistons.

Illustrated Price List on Application. Address Dept. C.

THOMSON METER CO.
100-110 BRIDGE ST., BROOKLYN, N.Y.

A. P. SMITH TAPPING MACHINE



The Smith Tapping Machine

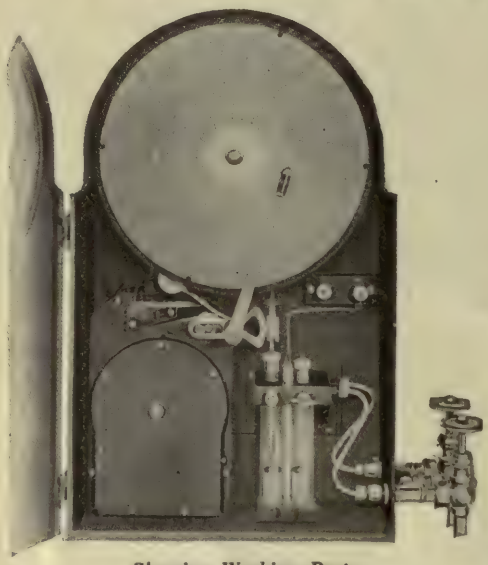
is used in almost every city of the United States and Canada, and giving perfect service.

Connection can be made to existing main without cutting off the pressure. New Hydrant can be set without disturbing the supply. Fittings used with machine cheaper than the regular tees and crosses.

Write for printed matter.

The A. P. Smith Mfg. Co.
East Orange, N. J.

The Manograph is Portable



Showing Working Parts

This instrument complete weighs only 55 pounds.

The light weight does not mean light, unreliable and delicate construction.

The extreme simplicity and absence of complicated working parts makes the Manograph a most desirable portable Recorder.

The Manograph may be used as a station meter for measuring pump discharge or may be taken into the field on waste detection or for the testing of large meters while in service.

WASTE DETECTION

Our engineers using the Manograph will conduct water surveys for the location of waste.

Let us present an outline of our methods and an estimate of cost.

Water Works Equipment Co., 50 Church Street, New York City

S. E. T. Specialties
for Improved Public Service

The Coldest Winter on record proves our claim that the

JERSEY METER BOX is "Freeze" Proof

All sizes up to 36 inches.

S E. T. ADJUSTABLE TOP fo Concrete, Brick or Cast Iron Manhole

Economical because it saves cost of main tenance. It can be instantly adjusted t street level and quickly readjusted wheneve necessary.

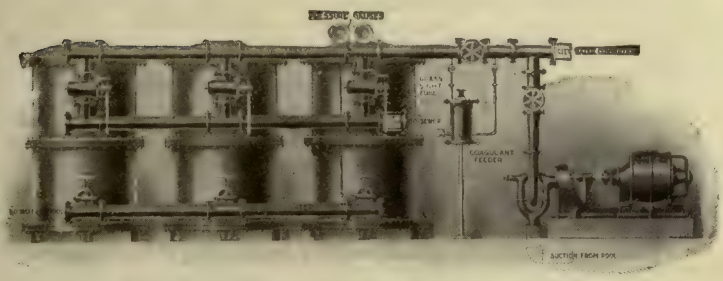
The cover is non-rattling and wears uniforml with the frame. Used by scores of cities all ove the country.

Send for information and prices

S. E. T. VALVE & HYDRANT CO.
50 Church Street, New York

SWIMMING POOL
INTERNATIONAL Y. M. C. A. COLLEGE, SPRINGFIELD, MASS.
R. D. KIMBALL, CO., Engineers

The above pool refiltered every day by
NORWOOD FILTERS



TYPICAL THREE-UNIT FILTER OUTFIT

Refiltration of pools ***Saves Water, Saves Heat,*** *and insures a clean, bright, sparkling, and sanitary pool at all times.*

NORWOOD ENGINEERING COMPANY
FLORENCE, MASS.

Cities and Towns Counties and States

in every part of the country are saving thousands of dollars for tax payers by means of little ads in the

Proposal Advertising Columns

of the

ENGINEERING NEWS-RECORD

This paper, with its circulation of 35,000 copies weekly, is read by practically all the important contractors and manufacturers who want contracts and know how to figure close in order to land them.

Get their prices on YOUR Contracts

It means a big saving, reliable work and the best evidence that you believe in business methods in municipal government.

To see how other towns save money

write for a recent copy of the Engineering News-Record (free) and look through the Proposal pages of this

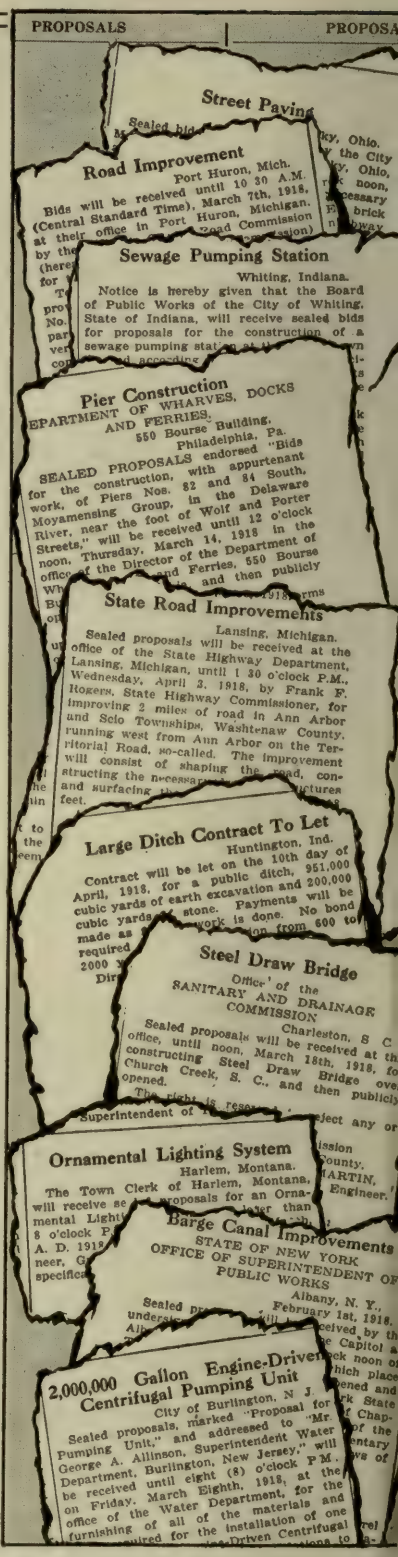
One Nationally Recognized Medium for Proposal Advertising

ADDRESS THE SEARCHLIGHT DEPARTMENT

ENGINEERING NEWS-RECORD

Tenth Avenue at 36th Street, New York

Chicago, Philadelphia, Cleveland, San Francisco



HAROLD S. BUTTENHEIM, Editor THEODORE R. KENDALL, Engineering Editor M. V. FULLER, Associate Editor

THE AMERICAN CITY

Published Monthly by The Civic Press, Tribune Building, New York—EDGAR J. BUTTENHEIM, President
HERBERT K. SAXE, Secretary-Treasurer—JAMES H. VAN BUREN, Advertising Manager
Branch Offices: Chicago, 327 South LaSalle St.—J. T. Dix, Western Representative; San Francisco, 320 Market St.—W. A. Douglass, Pacific Coast Representative
Entered at the Post Office at New York, N. Y., as second-class matter

PHILLIPS UNIVERSITY LIBRARY

Vol. XVIII CONTENTS FOR MAY, 1918 No. 5

ARTICLES APPEARING IN THE CITY EDITION ONLY

War-Time Needs of Water-Works 371
Methods and Results of Water Waste Elimination in Oak Park, Illinois 392
Provision for the Children's Summer Recreation 397
The Municipal Dam at Fort Dodge, Iowa. 398
The Water-Supply of the Great Lakes Training Station 400
A Living Flag of American Bluejackets ... 401
How Local Organizations Can Help the Ordnance Department 402
Views in the New Munitions Town of Gretna 404
Housing and City Planning Progress in St. Paul 406
Lima: The City of Kings 408

ARTICLES APPEARING IN THE TOWN AND COUNTY EDITION ONLY

Methods of Repairing Bituminous Macadam Pavements 391
New York State's Experience with Various Types of Road Construction Under Various Traffic Conditions 394
A Uniform Method of Cost Accounting for Road Work 401
Pennsylvania's Sixty-foot Concrete Highway 405
Modern County Fair Grounds 408
Better Bridges and Culverts 412

ARTICLES APPEARING IN BOTH EDITIONS

Block Pavements and Rail Fillers for Car Track Areas 415
Using Motor Trucks to Meet the War Emergency 417
National and Local Cooperation in Winning the War 420
School Work Vital in War Time 422
French and Belgian Reconstruction 423
Forward Steps Reported by Municipal Officials and Heads of Departments 424
- "The Proof of the Pudding Is in the Eating"
- A Fire Department That "Gets There"
- A Self-Supporting Municipal Bus Service
- An "Accident Map" and Its Uses
- The Garbage Can as a Food Conservation Witness
- Waste Reduction in Milwaukee
- An Air-Lift Water-Supply System and a Municipal Light and Power Plant
- Breaking Away from Tradition in School Work
- The First Motorized Fire Department in Utah
- "Spitless Day" in Chicago
- A Municipal Drug Addict Clinic

The New Lighting System in Los Angeles.. 439
Educate All in "Safety First" 440
"The King Can Do No Wrong" 443
The Public Benefactions of Private Citizens in Texas Cities 445
Mutual Fire Protection Aid Proposed for Connecticut Municipalities 446
Lightning Arresters a War Necessity 447
The Versatility and Endurance of Motor Trucks 448
The "Take a Roomer" Campaign 451
Good Advice on Public Safety and Courtesy 453
First Proportional Representation Election in Kalamazoo 455
On the Calendar of Conventions 457
Why One Community Has Rejected the War Chest Idea 459
Eliminate Cinder Subbase from Your Sidewalk Specifications 461
News and Ideas for Commercial and Civic Organizations 463
- Organizing Industries for War Service
  - Baltimore's War Service Committees
  - Cleveland's War Industries Commission
  - Williamsport Manufacturers Represented in Washington
  - Cincinnati's Survey of the Garment-Making Industry
- Recently Issued Printed Matter
- Commercial Bodies Can Help the U. S. Employment Service
- Establishemnet of Return-Loads Bureaus Advocated

Industrial Surveys for War-Time City Planning 475
Items of Municipal Law 479
- Municipal Water Plants
- Duty to Light Streets

Municipal and Civic Publications 481
Methods, Materials and Appliances 485

Two editions of THE AMERICAN CITY are published each month, both containing the same number of pages. The distinction in contents is indicated above. The subscription price of either edition is $3.00. For $1.00 additional per annum, any subscriber may receive both editions; or any subscriber may have his name transferred from the mailing list of the City Edition to that of the Town and County Edition, or vice versa, without extra charge. Canadian subscribers pay 50c extra per year to cover postage; other foreign countries $1 per year extra.

Back numbers of THE AMERICAN CITY are kept in stock by the publishers.

Roll Call

of White Truck Fleets In Actual Service

THE following is a list of cities, counties and states who own ten or more White Trucks, showing how these fleets grow from year to year as time and service prove their worth:

	1910	1911	1912	1913	1914	1915	1916	To-day
City of Atlanta	0	3	6	8	10	10	11	11
City of Baltimore	0	3	4	7	14	14	29	30
City of Boston	0	2	9	12	17	18	18	19
City of Chicago	0	0	0	1	4	10	27	38
City of Cleveland	0	2	7	14	15	19	23	32
City of New York	0	1	7	11	12	13	13	13
City of Pittsburgh	0	2	9	14	14	15	15	15
City of St. Louis	0	0	0	0	4	6	9	10
Hawaii County, T. H.	0	0	2	9	9	9	10	11
Onondaga County, N. Y.	0	0	0	0	1	3	5	10
Prov. of New Brunswick, Canada	0	0	0	0	0	0	20	20
State of Massachusetts	0	1	4	4	4	5	11	11
State of New York	0	0	3	3	3	5	29	37
State of Pennsylvania	0	0	0	0	1	2	5	15

There are 2,153 White Truck Fleets now in actual service, totaling 23,226 White Trucks. No single truck installations are included in these figures

A copy of the complete Roll Call will be mailed to anyone upon request

THE WHITE COMPANY
861 East 79th Street
CLEVELAND

VOLUME XVIII
NUMBER 5

The American City

NEW YORK
MAY,
1918

War-Time Needs of Water-Works

Rising Costs a Serious Problem—Extension of Service and Increased Rates Essential in Many Cities

THE Executive Committee of the American Water Works Association, by resolution adopted April 8, requests wide publicity to the effect of war conditions upon the maintenance and management of water-works. The resolution recites the following facts:

War-time conditions unavoidably have developed cardinal difficulties in the efficient operation and maintenance of water-works properties, both municipally and privately owned, and in some cases the situation and relief of this important public utility has become a subject of grave importance.

Water rates now existing were, as a rule, fixed before the war and were based upon conditions which then prevailed. Reliable information from a representative group of water-works shows that the average increase in operating expenses in the last three or four years has amounted to some 40 per cent, and that during the same period the gross revenue of this group of water-works has increased but about 7½ per cent.

The increased cost of operation, the difficulty of providing for maturing obligations, and of making necessary extensions to meet the requirements of the Nation's war needs and of expanding industries which water departments and companies share with all other public utilities, are, in the case of water-works, intensified by certain conditions peculiar to this service as:

(a) A water-works can gain no relief by temporary cessation of service at stated times or in certain areas. There may be moonlight schedules, heatless days and areas, less frequent train service, etc., but water service, from its very nature, must be continuous, both in time and extent. The needs of large industries or war needs cannot be met by diverting from other consumers. A water-works must carry its normal load and at the same time take care of its emergency service.

(b) The Nation's war program, including the mobilization of the country's industries, indispensably requires extensions of service by water-works. A water-works extends its service and enlarges its facilities by increasing its pumping and purification equipment and by laying additional pipe. In such extensions iron products constitute the chief element, which products have increased in price enormously and probably more than any other commodity in general use. Since 1915, iron pipe has increased in cost 150 per cent, and pumping machinery and filtration equipment from 100 per cent to 200 per cent. Since there can be no enlargement and extension of industries to meet war needs without increased and extended water service, water-works are powerless to avoid expenditures for this purpose and unable to escape the payment of such vastly increased prices.

(c) The greatly increased cost of operation, which affects all public utilities, seriously affects water departments and companies in particular, for the reason that the largest single item of expense in the operation of water-works is fuel. In normal times fuel constituted about 15 per cent of the total cost of operation. Now

fuel cost is approximately 30 per cent of the total cost of operation. In addition to this, the cost of water purification has increased more than 40 per cent and cost of distribution more than 20 per cent of the normal cost of operation.

The general public, and in fact many state and municipal officials, appear not to visualize clearly that even properly imposed increases in the cost of labor and essential materials must of necessity likewise increase the difficulties and cost of managing water-works properties efficiently. Considerations of equity and the vital necessity of maintaining continuous and adequate service require that the water consumer bear his proportionate share of such necessary increase in expense, to the end that water departments, whether municipally or corporately operated, should not be forced to operate at a loss or be deprived of the reasonable return on their business necessary to command capital upon advantageous terms, for required extension and for the betterment of the service.

In time of war it is vitally essential, so far as is consistently possible, to conserve the health and well-being of the public, and to guard against fire losses, by providing pure and adequate water service to the public, and to the industries, particularly those engaged in the manufacture of war materials. Without an equitable balance between the cost of operation and management of water-works and the revenue received from service, it is inevitable that the maintenance in a satisfactory manner of this vitally important essential must of necessity deteriorate.

Methods and Results of Water Waste Elimination in Oak Park, Illinois

By H. P. T. Matte
Engineer, Oak Park Water Department

We in Oak Park firmly believe that the greatest and most important factor in the elimination of waste is complete meterage, but we are going to try to show that it must be supplemented by other elements in order to be entirely effective.

These elements are as follows:

1. Strict maintenance of meters.
2. Rigid collection of high bills due to leakage or waste.
3. Efficient complaint department, to take care of complaints caused by excessive water bills. This includes the education of consumers.
4. Master meter for measuring the entire supply to the distribution system; that is, a recording Venturi meter, or any of the various types of recording pitometers, with accompanying recording pressure gauges.
5. Periodical waste surveys.

To these we have added the following two important, altho often overlooked, elements in the control of waste:

6. Absolute control of all the divisions of the water department by the manager.
7. Strict adherence to the rules and regulations, or ordinances. This means that the water department must be upheld by the municipal authorities. In other words, let the water-works be out of politics entirely.

The foregoing rules have been in force in Oak Park, and to that fact we ascribe the following results:

During the four-year period between 1913 and 1917 inclusive, altho the population increased 34.6 per cent, and the number of services or meters 32.5 per cent, the daily consumption increased only 20.7 per cent. The daily per capita consumption has decreased from 75 gallons to 67.6 gallons, or 10.6 per cent, the minimum night rate of consumption has diminished 37.5 per cent, and the ratio of the minimum night rate to the average daily consumption has dropped from 40.8 per cent to 21.2 per cent or 48 per cent. The percentage of water accounted for by meters has increased from 72 per cent to 83 per cent.

The City is Completely Metered

Oak Park has always been, and is now 100 per cent metered. Now, by 100 per cent we mean *just that*. All the water pumped into the distribution system, excep

INTERIOR OF PUMPING STATION, OAK PARK, ILL.

that which is lost thru underground leakage, is delivered thru meters. This includes all municipal buildings, watering-troughs, drinking fountains, street sprinkling, water used in parks, and fire hydrants when used for other than fire purposes. Water used in the construction of houses is sold thru meters buried in the parkway. Moreover, *there is no free water.*

Referring to item number 1, *Maintenance of Meters,* please note that all meters are tested periodically, a practice which we have found profitable, altho not required by the Public Utilities Commission. Meters are read every quarter in a continuous reading system, for which purpose the city is divided into six districts, so that those meters found to be not registering can be brought into the shop, repaired and put back into service within a week after being read.

All Bills for Leakage Are Collected

The second point, *The Rigid Collection of High Bills Due to Leakage,* is important and has a beneficial effect on the success of the meter system. In other words, altho it may be hard on the consumer, he will, if properly impressed, appreciate the importance of watching his fixtures, and will become educated in spite of himself.

No reduction in bills is made on account of leakage. Short and pointed instructions, which include the policy of the Water Department, are printed on the backs of the water bills. If the complainant has been guilty of the characteristic failing of mankind, that of being unobserving and neglecting to read the information supplied to him every three months, he deserves to pay for his inattention.

This does not mean that we are heartless and that we do not admit mistakes. The consumer is given the benefit of the doubt from the first, owing to the fact that we realize that we are but human ourselves and can be in error in several ways. In fact, we let it be known that we are glad to correct our faults. If, however, upon thoro investigation we find that the water was consumed thru leakage, or otherwise wasted, the bill must be paid. In order to be fair, certain allowances are made if the waste was in the ground and invisible. In this case the lowest rate at which water is sold in Oak Park is allowed, altho the quantity consumed may not justify the consumption to be placed in that class.

In any case of high bills, whether this concession is given or not, if the consumer is plainly unable to pay the bill as it stands (these claims are investigated), an install-

ment plan of payment is adopted; but with the provision that the bill must be paid within a year.

The reason for this apparent "Germanic" attitude is this: every student of human nature knows that if a water department is reputed to be lenient, the average person takes a chance and depends upon his ability as a "bluffer" to get out of paying the bill. Talk is cheaper than plumbing bills. If he is victorious because "he has been unfortunate and won't let it happen again," he surely *will*. In the old days of leniency we found that Mr. Average Consumer *did* do it again. If he gets a rebate, he tells his neighbor, and you can't tell the neighbor you never allow reductions, because he "did not realize that the little sound in the bathroom" meant a high water bill. No,—you can't refuse the second time unless you are willing to be classed as an old-time politician.

This second concession means a third one, and so on down the line, until you are forced to spend your time vacillating between efficiency and poor management. In the meantime the "water unaccounted for" is increasing instead of decreasing.

All Complaints Are Thoroly Investigated

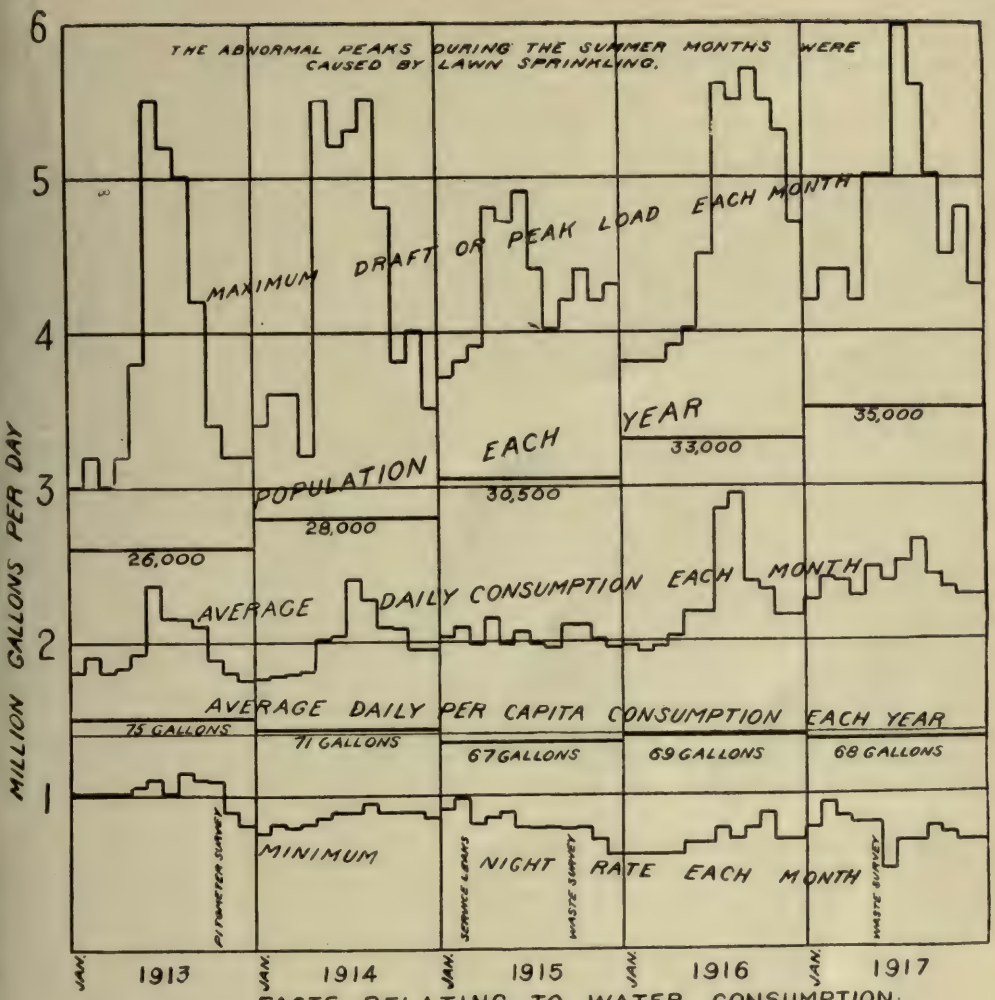
But you can't handle this matter properly without an *efficient complaint department*. Without it you cannot *prove* your case. Every water-works man who has had to deal with consumers under the meter system is aware of the number of excuses and prevarications that evolve in order to make the management believe that there was a mistake made in the reading, that there are no leaks, that the fixtures have not been repaired recently, that the meter works when no water passes thru it, that the meter reader is in collusion with the "bunch of grafters in the office," and read the meter from the next block, and so on.

Oak Park, however, is prepared to prove to all these amateur lawyers that they have no case in court. We have a record of all complaints, of whatever nature, that have been made to the water department and about the water department for the last five years. These are arranged by years in 3 x 5 card files, and are the original records. All calls are recorded on the same sized cards, three colors being used to distinguish between complaints relating to meters and bills, complaints and job orders relating to the mechanical division, and those relating to delinquent bills. This record is very valuable in refuting unjust accusations, in tracing past records, and for the purpose of settling especially difficult problems.

All complaints concerning high bills are investigated, and a comprehensive written report is made to the consumer. The nature of the complaint is written on the card provided for that purpose, and the card is given to an inspector who makes a specialty of investigating high bills. We have found that it is impracticable for the meter reader to waste time in making investigations. He notes all unusual sounds or evident leakage, on the reading slip, and a special call is made. Sometimes a consumer is dissatisfied even after a second investigation, and he is allowed to hold the payment of the bill until the next quarterly statement, when he will see for himself the result of stopping small leaks. If, however, a rebate is yet expected or sought, a final notice of "Shut off for non-payment" is issued, and the water *is* shut off in spite of threats of litigation.

For the purpose of determining the cause of persistent high bills, where "there are only two in the family, no leaks, and there is no sprinkling done; while the family next door has three or four children, does its own washing, sprinkles the lawn all day, and has only minimum bills," we have evolved a recording detector which is substituted for the meter and which gives a graphic record of the consumption for 24 hours or a week. We can thus spot the number of times the faucets are opened, the number of baths with quantity used each time, and the number of times the toilets are used.

Thus we have often found, and were able to show, that the toilet valve would not work about every fifth time it was operated, and that the lady of the house was apparently too clean, having the habit of letting the water run in the kitchen sink too long each day, or that somebody took a cold bath every morning and consumed about fifty gallons each day in the operation, or that a thermostat used by a central heating plant leaked at some time during the day, or that the toilet was used too



FACTS RELATING TO WATER CONSUMPTION AT OAK PARK, ILLINOIS.

often to wash down foreign substances that did not belong there, or, finally, that the servant was very wasteful.

Our complaints on account of high bills dropped in number from 2,000 in 1913 to 600 in 1917, on account of the education of the consumers, who, realizing that we mean business and are strictly impartial and able to help them reduce their water bills, have begun to coöperate with the Department.

Leakage Detectors on the Distribution System

We now come to the third item in the efficient elimination of waste. This is the *Installation of Recording Pressure Gauges and a Master Meter* directly on the distribution system. The combination of the two devices is a vast aid in estimating the rate of consumption during the night which is due to leakage alone, in noting the progress each day in the stoppage of leaks, and in determining the necessity for making a special waste survey. The efficiency of the pumping station attendants, as well as that of the pumps, can be determined at a glance. So many plants are equipped with Venturi meters or Pitometer recorders placed on the suction main leading to filter-beds, or to reservoirs or stand-pipes; the character of the consumption cannot be accurately determined by meters so placed that you cannot see the fluctuations.

How the Waste Survey Is Made

The Waste Survey, one of the most im-

portant elements in the prevention of continued needless waste on a metered water system, is next on the list, and we hope to see it become more popular.

In order to shorten the work of making waste surveys and avoid unnecessary work, it is advisable to make first a rough survey of the entire city with a Pitometer, which is done by isolating certain districts and measuring all the water consumed thru one of the mains as a feeder. Here is where the master meter on the distribution system comes into use. We often shut down large districts for a few minutes and note the drop on the Venturi chart. In our case it is impossible to do this at night, because the velocity is only 400 gallons per minute between the hours of one and four A. M. In fact, the smallest pump is so throttled in order to maintain our assumed pressure of 40 pounds that the opening is left equal in area to that of a 2-inch pipe. Our Venturi meter is not sensitive enough at that low velocity; but we accomplish nearly the same result in the daytime during periods of steady consumption when we have a velocity of 2 or 3 thousand gallons per minute. In this case the drop has been found sufficient to allow the making of an analysis of the leakage conditions. The Pitometer is the surest way, however. With it accurate information can be obtained and so the "good districts" can be eliminated.

After the Pitometer survey, especially when the leakage is so small that there is little velocity in the mains, the "hydrant and hose method" follows logically. It is practically useless to expect any headway if a displacement meter is used, as the rate of consumption and the minimum flow cannot be accurately determined. We use a 2-inch Venturi meter, but a Pitometer inserted into a short piece of pipe 2 inches or smaller in size is as good. A manometer and as much condemned fire hose as you can obtain from the fire department complete the outfit.

During the summer of 1917 we tested 18 miles of mains, and stopped a leakage amounting to 220,000 gallons per day. This represented a saving to us in cost of water as purchased from the city of Chicago, of $5,000, and the outfit used cost only $150, exclusive of the hose. We were also enabled to reduce our night rate of consumption to the assumed standard of 20 per cent of the average daily consumption.

A Single Head for the Department

Just a word on the final factors in the control of the water system. It has been our experience that in order to be most efficient, a water department must be under one head. That is, not only should the manager take care of the mechanical end of the water-works system, but also the financial part. He should also inaugurate the policies. It is very difficult to handle complaints regarding high bills and to give satisfaction if the money is collected in one department, "shut-offs" for non-payment of bills in another, and the bills rendered in either of the foregoing, or in a third one.

It is difficult for the superintendent or manager to make a decision and be obliged to back down if the complainant is able to obtain a concession from someone higher up who is not vitally interested in the efficient operation of the department and who would yield to pressure from some political adherent. It is difficult to enforce ordinances or rules if exception must be made in the case of persons of influence or important political henchmen. It is impossible to prevent needless waste of water if certain organizations or institutions by vote of the municipal authorities are allowed free water against the advice of the manager.

We acknowledge that we could do absolutely nothing toward the efficient management of the Oak Park Water Department were it not that our municipal authorities are intelligent business men who investigate all complaints thoroly before acting upon them, and stand back of all our apparently arbitrary decisions, which, tho they may cause temporary bad feeling, make for the betterment of the Department.

In short, we are able to live up to our water ordinance to the letter. It is not a "mere scrap of paper."

Editorial Note.—The foregoing article is from a paper presented at the tenth annual meeting of the Illinois Section of the American Water Works Association.

PHILLIPS UNIVERSITY

Provision for the Children's Summer Recreation

WADING POOL, ZABRISKIE PLAYGROUND, JERSEY CITY, N. J.

WADING POOL AT FALL RIVER, MASS.

The New Municipal Dam at Fort Dodge, Iowa

A Revenue-Producing Utility Which Also Provides a Pleasure Resort for the Citizens

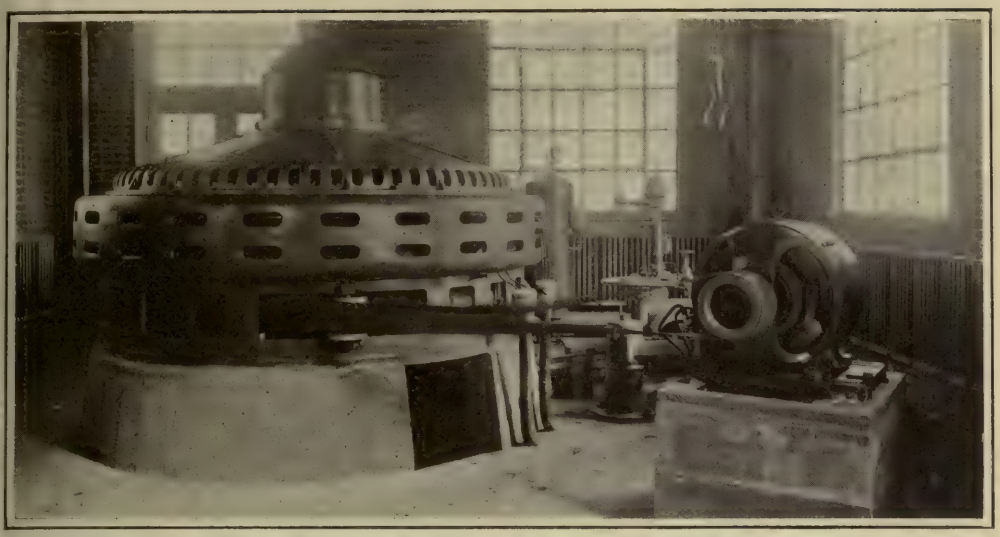
By R. E. McDonnell

FORT DODGE, Iowa, a city of about 30,000 population, located on the Des Moines River, some time ago conceived the idea of building a municipal dam. Two objects were in view: first, a financial investment that would be profitable to the citizens from the sale of power that would be developed; and, second, the creation of a lake that could be utilized for pleasure purposes. Fort Dodge being an inland city and a long distance from any body of water, the lake idea for fishing, boating and bathing proved to be very popular, but the citizens were determined that the project should be municipally owned and controlled.

After two unsuccessful efforts, the city finally voted bonds for the municipal project. Its feasibility was patiently explained and exploited by Mayor John F. Ford for a number of years before the public became fully aroused as to its necessity. The campaign for the bonds under the auspices of the Commercial Club was an interesting feature of the entire enterprise. The engineers transferred their preliminary plans, estimates and all data to stereopticon slides, and these slides were exhibited at mass meetings previous to the bond election, and showed the proposed sites and how the dam would look after construction. With these illustrated lectures given by the engineers, the citizens were enabled to vote intelligently on the project, and the bond issue for the improvements carried by a large majority.

The spillway section of the dam is 230 feet long and is of solid concrete construction. One hundred and thirty feet of the dam consists of five sluice gates of the Tainter type, built of structural steel with a radius of 17 feet and arranged so that all five gates may be raised by a motor-propelled electric hoist, allowing the flood stages of the river to pass thru the gates and thus avoiding the overflowing of large areas of land. The dam has a height of 18 feet above the bed-rock of the stream, with a concrete toe 4 feet deep and 3 feet wide on the up-stream side. The concrete portion of the entire structure is 412 feet

VIEW OF THE DAM AT FORT DODGE, SHOWING THE FIVE SLUICE GATES



THE 500-HORSE-POWER TURBINE AT FORT DODGE

wide, including a concrete fish-ladder at one end as required by the state law of Iowa. The raising and lowering of the gates controls the water level above the dam during high-water seasons, and the gates also control the water level above the dam in the winter and can be manipulated to avoid the structure's being damaged by the breaking ice in the spring.

The concrete spillway of the dam was finished February 28, 1917, and on March 21, while the gates were open, a heavy mass of ice came down the river with so much velocity that it tore out the walls of the head-gate chamber and damaged the structure considerably. Before the gates could be closed, large blocks of ice several feet thick passed over the dam, and, the water on the down-stream side of the dam being low, the ice went over the dam without any cushion of water to break the force of the blocks as they dropped. The grinding and hammering effect of the ice on the toe of the dam caused a large hole to be scoured out on the down-stream side. The limestone was fissured, and thru the fissures in the bed-rock streams developed which scoured out a large opening under the dam. Considerable damage was done before the gates could be closed and the water raised. The repairing of the hole under the dam was accomplished by driving steel sheeting on the up-stream side of the dam and by building a coffer-dam on the down-stream side of the dam. The hole, which was about 60 feet in length and large enough for a man to walk thru, was poured full of concrete, and a reinforced concrete apron was constructed on the down-stream side of the dam.

The entire work was finally finished on December 14, 1917, and was tested out and accepted by the city on March 1, 1918. The total cost of the project, including power-house, turbine, generator and transmission line, was approximately $130,000.

The power-house is of brick and reinforced concrete construction, 56 feet long and 22½ feet inside width. One 500-horse-power vertical turbine of the Francis type was installed, and foundations are already built for a second unit, which will be installed later, giving a total development of 1,000 horse-power. The power is transmitted to the water-works station about three-quarters of a mile below the dam, and used for pumping the water. Since placing the plant in operation the city has accomplished a saving of approximately $40 per day on fuel alone.

The lake formed by the backing-up of the water is about 8 miles in length and will average 500 to 600 feet in width.

The design and supervision of the work was carried out by Burns & McDonnell, consulting engineers, of Kansas City, Mo., with Leland C. Angevine, resident engineer in charge of construction. Mr. Angevine has since been placed in charge of the operation of the municipal power plant.

The Water-Supply of the Great Lakes Naval Training Station

By Owen J. Mink, M. D.
Surgeon, United States Navy, Great Lakes, Ill.

THE Great Lakes Naval Training Station is fortunate in being able to derive its water-supply from that great inexhaustible fresh water reservoir, Lake Michigan. However, this supply is continually contaminated by the sewage of every town along the Lake Shore between Evanston, Illinois and Milwaukee, including the Naval Station itself.

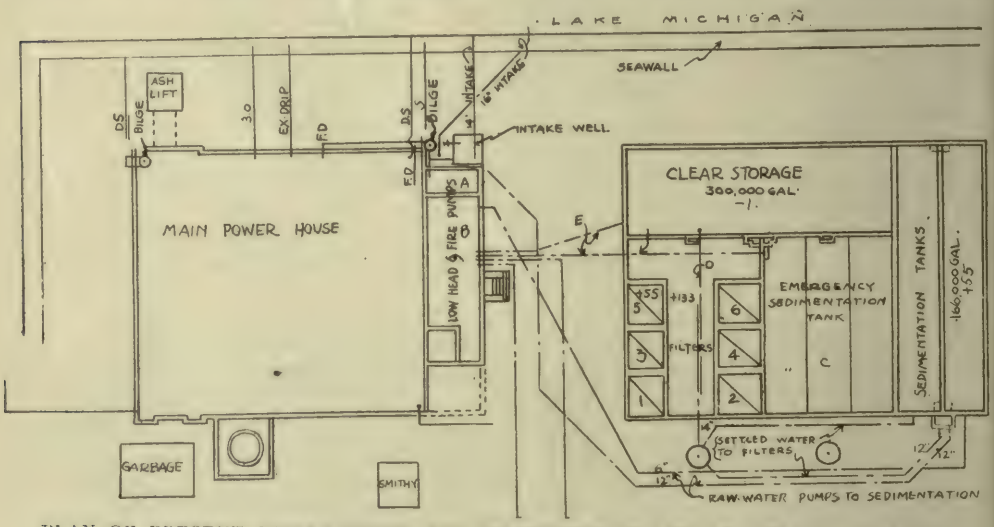
The city of Waukegan, 2½ miles above the station, empties into the lake 5,000,000 gallons of sewage daily; North Chicago, adjacent to the station, 1,500,000 gallons; the Naval Station 2,500,000 gallons, partly treated; Lake Bluff, two miles south, 500,000 gallons. Within five miles of the coast line, 9½ million gallons of sewage are thrown into the lake daily.

On April 1, 1917, the station had 1,500 men, and the daily consumption of water at that time was 200,000 to 300,000 gallons. Now, one year later, the station population is 23,000 and the average daily consumption is 2,500,000 gallons.

The intake cribs in Lake Michigan are at a point about 1,200 feet from the seawall and where the water is about 18 feet deep and flows by gravity into an intake well. From this well, low-lift pumps deliver the water thru piping to sedimentation tanks, where alum is applied as a coagulant, and the water travels thru baffles for mixing; it has a total travel of about 190 feet and a sedimentation period of about 90 minutes.

There are now five rapid sand filters in operation, with the equipment for a sixth filter being installed, each having a nominal capacity of 500,000 gallons per 24 hours.

From the filters the water passes to the clear water storage, where chlorine is applied for final sterilization. The alum dosage varies from ½ to 1½ grains per gallon, and chlorine is used at the normal rate of 4 pounds per day, or with the average daily pumpage of 2½ million gallons, 0.19 parts per million.



PLAN OF PRESENT POWER-HOUSE AND FILTRATION PLANT AT GREAT LAKES, ILL.

The station laboratory makes daily analysis of the raw, filtered and chlorinated tap water. The raw water is badly polluted, pollution varying with the direction and velocity of the wind and the currents in the lake. During the four months, December to March inclusive, only twice did the

tap water show gas formation in one cubic centimeter amounts.

The station will soon be increased to 50,000 men, and plans are under way for four more filter units, which will bring the total daily capacity to 5,800,000 gallons.

A Living Flag of Bluejackets

As Pictured on the Front Cover of this Issue

IT was an Indian Summer day in November, 1917, at the Naval Training Station, Great Lakes, Illinois. The November breeze whipping off the shores of Lake Michigan gave just enough twang to the air to make one feel vigorous. From every corner of the station columns of American seamen were converging on the mammoth parade grounds, where thousands of bluejackets have been reviewed by our nation's celebrities. Under command of officers the thousands of bluejackets began a seemingly weird formation. It was indeed new, for the army and navy drill regulations hold no mention of it. This formation went busily on for a half-hour without any definite object being attained. Then suddenly there stood out in vivid line and detail a true, living American flag. It was the first Living Flag of 10,000 souls, every one ready to fight for liberty, and there was born to our nation and the world "The Liberty Flag of the World War." The Liberty Flag is a breathing mass of humanity pulling taut on its "rope" and attached to a "pole," the largest in the world; it lived only for a few minutes in its compact form, but its thousands of minute parts will live on for a generation; they will go to different parts of the world on ships of the navy, each to deliver a blow for democracy.

The purpose of this impressive formation is that photographic copies may be handed down to future generations and hung in the Halls of Fame thruout the land to show that in flesh and blood is synchronized that for which our Nation stands, that for which its people will give up their life if need be.

The sketch of this great picture was made by a skilled and thoroly rehearsed corps of artists who took six weeks to complete it.

Experts worked out an exact replica from the law of perspective. This flag if laid out in proper proportion would not be recognized as a flag when photographed. Consequently it was laid out with consideration to the law of perspective and viewed from "the eye of the camera" so that when photographed it stood out in its full and proper proportions.

When one looks at this photograph it is difficult to realize that in real life the space required was more than seven acres and that the star in the extreme left-hand corner was 65 feet long and contained 126 men, while one of the extreme front stars was only 8 feet long and contained 12 men.

The following figures are equally bewildering:

The pole (not including the ball) was 4 feet in width at the bottom, 6 feet in width at the top and was 550 feet in length and contained 700 men.

The ball was 20 feet wide, 237 feet long and contained 250 men, the ball being nearly one-half as long as the pole.

The flag itself measured 293 feet in length at the top, 73 feet in length at the bottom, 428 feet in width at the left end and 128 feet in width at the right end. It will therefore be seen that the top of the flag is more than four times the length of the bottom and that the left end is more than three times the length of the right end.

The star field measured 143 feet at the top, 66 feet at the bottom, 350 feet at the left end and 184 feet at the right end.

Sixteen hundred men were required for the white stripes, nineteen hundred men for the red stripes, eighteen hundred men for the stars, and approximately thirty-four hundred for the blue field.

The exact total of men required was 9,650.

How Local Organizations Can Help the Ordnance Department

Definite National Needs Which Chambers of Commerce Can Meet

AN address which created considerable interest at the War Convention of Secretaries, held April 12 in connection with the meeting of the Chamber of Commerce of the United States, was that of Fred Clayton Butler, secretary and treasurer of the National Association of Commercial Organization Secretaries and now director of community work for the Industrial Service Section of the Ordnance Department.

Mr. Butler outlined a definite, concrete program for practical work in the many cities of the country in which the Government is carrying on the manufacture of materials of war either directly or thru contract. This program differed from the usual exhortations to "help win the war" in that a list of definite needs was given which almost any chamber of commerce in this country can well incorporate into its program of work.

A Powerful Factor Hitherto Overlooked

It has been something of a disappointment to chamber of commerce executives in the past that the various departments, commissions and boards of the National Government have not more generally recognized and used the various local commercial organizations in working out the many problems connected with the war. As Mr. Butler pointed out, most of the great national problems are, after all, simply a vast group of local problems. Notwithstanding this fact, many governmental agencies have quite overlooked the most powerful factors in the solution of these local problems—the chamber of commerce.

Government authorities have in many instances actually created within our cities independent bodies to work out the problems which the chambers of commerce were already organized, financed and equipped to solve. In not a few instances, the chambers of commerce have had to reach out and rescue from the hands of such volunteer groups the various problems that had been entrusted to them in order that the tasks might not go by default. This has been true in many cities of the Liberty Loan, of the conservation of food and fuel, of the thrift stamp campaign and many others.

The Industrial Service Section of the Ordnance Department, on the other hand, as represented by Mr. Butler, comes to the chambers of commerce with a distinct recognition not only of their powers but of their actual necessity within a community. The Ordnance Department is interested in the production of munitions of war, and the program outlined by Mr. Butler is a recognition for the first time by any government department of the vital influence of a community and social program upon the output of industry.

Labor the Most Important Element of the Problem

The Industrial Service Section was created to deal with all matters affecting the element of labor in the production of munitions. Men, money and labor are the three links in the chain upon which the winning of the war and the salvation of democratic institutions now hang. Thru due process of law, the Government can command the last man and the last dollar of our resources. Labor, however, can be controlled in no such way, and yet it is of even greater importance than men and money, for without labor the money cannot be spent nor the men transported to the battle-field.

This aspect of the problem was early recognized in the Ordnance Department, and Dean Herman Schneider of the University of Cincinnati, a man possessing to an unusual degree the confidence and respect of both capital and labor, was taken to Washington and placed in charge of the labor factor in the production of munitions. Dean Schneider's problem divided itself into matters of housing, employment, women's work, labor adjustment, etc., and he in his turn sought the help of Washington men and women who had had experience and training in these different phases of the main problem.

The last two or three years have been marked in all lines of industry by exceptionally high rates of labor turnover. In the production of munitions this became an especially acute problem. This was accounted for in part by the fact that working conditions in many of the munition factories had been thrown out of normal by a great and sudden increase in the working force. Conditions in the various communities quickly became abnormal for the same reason. Men found themselves unable to secure from the new communities to which they were brought, the social and community pleasures and privileges to which they had been accustomed. This manifested itself in a restlessness and a labor turnover so great that the loss of efficiency was marked by a startling fall in the line of production.

A study of the situation disclosed the fact that many of the causes of this deplorable shifting of labor were of the community rather than of the shop. It became necessary, therefore, to arouse the various communities to the need of work upon their part if these new workers and their families were to be assimilated into citizenship. To undertake this task, Mr. Butler, who has had an experience of many years in community organization work, was called from his position as secretary of the Chamber of Commerce of the Tonawandas, New York.

The problem as it relates to the production of ships and their parts has been set forth by Edward A. Filene, Chairman of the War Shipping Committee of the Chamber of Commerce of the United States, in an article in the April number of *The Nation's Business*, entitled, "The Way to Lose the War." All of the suggestions advanced by Mr. Filene regarding coöperation by chambers of commerce in the production of ships and their parts can be applied with equal force to the production of munitions.

A Program of Coöperation

Mr. Filene points out that chambers of commerce can ascertain what is being manufactured in their cities that is essential to the prosecution of the war, and that they can then work with the manufacturers to see that everything humanly possible is done to expedite production. Among the excellent suggestions made by Mr. Filene are those of placing the services of the traffic manager of the commercial organization at the disposal of the manufacturers of essentials; changing the opening and closing hours of the stores to reduce the peak load upon local transportation facilities; installation of jitney lines to help get men to and from their work without delay and fatigue; appeals to citizens to open their homes to the workers that they may have a place to sleep pending provision of adequate housing facilities; admission of men wearing the badge of service to moving picture theatres at a reduced rate; and the provision of central employment facilities thru which other local employers may release to this national service men from their plants with the least possible confusion and to the greatest efficiency.

In addition to these excellent suggestions, Mr. Butler submits the following program:

Campaign of patriotic education to impress upon workers that they are the second line of defense and their efforts absolutely essential to the safety of the men in France and the winning of the war

Formation of housing companies and of building and loan associations and the encouragement of home-building by individuals

Extension of trolley tracks to new districts and increased service

Extension of water, sewer, gas and electric service to the new housing districts

Ordinances to prevent the exploitation of the workers

Encouragement of growing of produce by near-by farmers, and installation of public markets for producer and consumer

Provision of facilities for plowing and harrowing home gardens

Installation of branch libraries for convenient use of new workers and their families

Erection of community center "huts" with moving pictures, supervised dances, concerts, lectures, etc.

Increased school facilities for children of new workers, and night schools during winter months for adults

Control of alcohol and social evils, and education of workers by medical specialists

Complete Americanization movement for naturalization of aliens, and instruction in history and citizenship

Education of workers, their families and especially the children to the need for thrift, and the complete utilization of the workers' time

The carrying out of such a program will have not only altruistic benefits, but also a direct and potent bearing upon the stability of labor, the production of munitions and the winning of the war. All of these activities are within the scope of the modern chamber of commerce.

Views in the New Munitions Town of Gretna, Built by the British Government to Meet War Conditions

Showing the Provision Made for the Comfort, Health and Recreation of the Workers, Whose Endurance is Essential to the Winning of the War

A GROUP OF STUCCO COTTAGES

Photographs by courtesy of the Journal of the American Institute of Architects

THE DENTAL CLINIC

COTTAGES USED AS HOSTELS, CONNECTED BY PASSAGES AND MANAGED BY ONE MATRON

These buildings were erected as shells, to be transformed later, by the insertion of partitions and fire walls, into five- and six-room cottages

THE RECREATION BUILDING, WHERE DANCES, GYMNASTICS, AMATEUR THEATRICALS AND GENERAL GATHERINGS ARE HELD

THE MOTION PICTURE THEATER

The revenue from this theater contributes largely to the expense of the welfare work and the general management of the communal properties

Housing and City Planning Progress in St. Paul

IN June, 1917, the city of St. Paul, thru the Wilder Charity, an endowed foundation, and the St. Paul Association, conducted an investigation of the housing problem of that community under the direction of Dr. Carol Aronovici, Social Service Director of the Wilder Charity, with the assistance of a Housing Commission, appointed by the St. Paul Association. A careful study of the homes of over 20,000 people was completed, and a report, which was reviewed in THE AMERICAN CITY for March, was published.

This report showed that St. Paul was affected by housing problems similar to those found in most cities of the country, and that while a great deal of room congestion was not apparent, the problems of sanitation and safety were not being handled adequately, either in the control of new buildings or in the maintenance of old structures. It was also clear from this study that there was an insufficient amount of open spaces for playground purposes, that the street layout was inadequate to handle the traffic, that buildings were being constructed on lots which were not standardized, and that land was being sweated

A BASEMENT LIKE THIS IS NO PLACE FOR A MILK BOTTLING PLANT

THIS SORT OF WORKINGMEN'S LODGINGS SHOWS URGENT NEED OF HOUSING REFORM

in many ways.

By using as a basis legislation already available in the cities of the United States, particularly the Michigan and Minneapolis codes, an ordinance was drafted to meet the needs for control of housing in the community. After many conferences with the Builders' Exchange, local architectural groups and the various business men's associations, many of the objectionable features of the ordinance were eliminated, and some of the objections raised by the local real estate interests were withdrawn on the ground that the interests of local housing demand the restrictions to which objections had been raised. It stands to the credit of the Real Estate Board of St. Paul that, after a careful analysis of the ordinance, a unanimous endorsement was given and the ordinance was passed and signed by the Mayor on March 28.

As an outgrowth of the housing survey and because of some of the difficulties in the local transit system of St. Paul, steps were taken to provide means for the development of a city-wide plan.

An ordinance, drafted by a quickly organized City Planning Committee and made up of representatives of the most important civic and business organizations of St. Paul, was enacted into law. This ordinance provides for a City Planning Commission of twenty-five, appointed by the Mayor. The Mayor and the City Council, as well as the Corporation Attorney, the Superintendent of Parks, and the City Engineer, are ex-officio members of this Commission, with the addition of fifteen citizen members at large. The ordinance provides that all city planning projects shall be submitted to this Commission for approval; and while the approval or disapproval of the Commission is not binding upon the City Council, which gives final sanction to city planning projects, the fact that the City Council sits with the Commission at its sessions presents a most unusual opportunity for an intelligent discussion of such projects and the securing of progressive policies.

A STEEP OUTSIDE STAIRWAY AND A RUBBISH-FILLED YARD

In carrying thru the survey and in securing the enactment of the housing ordinance, the St. Paul Association, thru its Housing Commission, rendered most valuable service. The report on the housing survey was sponsored and published at the expense of the St. Paul Association.

Under this heading is being published during 1918 *in* THE AMERICAN CITY *a series of articles on Central and South American municipalities, thru the courtesy of the Pan-American Union. The Pan-American Union is the international organization, with headquarters in Washington, D. C., maintained by the twenty-one American republics for the development of good understanding, friendly intercourse, commerce and peace among them. The sixth article of this series will deal with municipal conditions in Mexico City.*

Lima: The City of the Kings

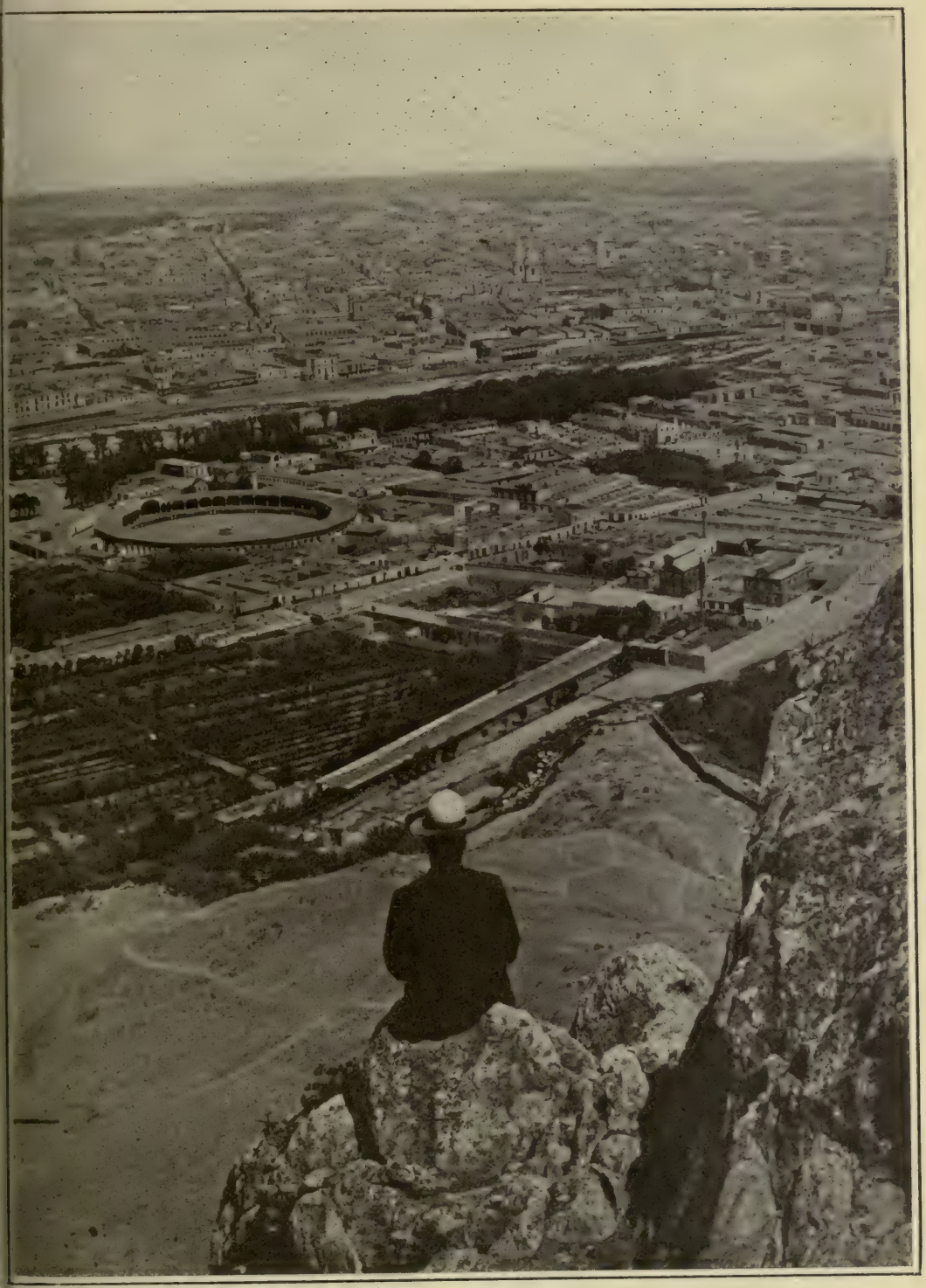
COMPARATIVELY few foreigners see the interior regions of Peru today; but a vast majority of those who voyage up and down the Pacific pay brief visits to Lima, the City of the Kings.

The port of Callao is only 8 miles distant from the capital of the republic. The former has the most modern docking facilities yet completed on the west coast of South America, and many ships tie up at the piers and land passengers and freight directly on terra firma. Callao has about 35,000 population and is a busy, cosmopolitan city. Many persons who have commercial interests there maintain their residences in Lima, so that the port in many respects might aptly be termed the "down-town" district of Lima.

There are three methods of transportation between the two cities—steam and electric lines and the ancient public highway. The visitor naturally chooses the electric line, which has its terminus near the water-front, and half an hour later arrives in the City of the Kings. The electric station in the capital stands on a broad plaza, from which automobiles and carriages are available for the short ride to Lima's leading hotel, adjoining the Plaza Mayor.

Lima is located in an undulating valley which extends inland from the ocean for 50 miles or more to the foothills of the Andes, altho numerous mountain spurs rise here and there about the valley, two of which, San Cristobal and San Jeronimo, dominate the city of Lima. Thru this valley the river Rimac winds its way to the sea at Callao, starting from rivulets at least 17,000 feet high amid the eternal snows of the mountains. The Rimac flows directly thru Lima, the larger city development being on the southern side of the stream. The river is spanned by several bridges, over which passes a constant traffic.

Nearly four centuries have passed since Pizarro laid the foundation stones of the cathedral on the central plaza known today as Plaza Mayor. Lima, with its population of 200,000, has been a long time growing to present proportions. In shape the city was originally more or less a giant triangle, the hypotenuse of which was formed by the Rimac. Pizarro bestowed the name of City of the Kings upon the place as a token of honor on behalf of his royal benefactors; but gradually the native title seems to have become more and more popular. Lima's streets were made to run parallel from northeast to southwest, the crossing points forming right angles, each street being narrow (30 to 35 feet), but with numerous



Copyright by Underwood & Underwood, New York

GENERAL VIEW OF LIMA FROM THE HILL OF SAN CRISTOBAL

The winding drive from the heart of Lima to the top of this hill provides a most attractive view of the city and environs. Near the center of the picture we have a glimpse of the Rimac River, flowing with cool water from the snowy mountains. The Plaza Mayor may be located by the twin towers of the cathedral. The large circle on the left is the bull ring, one of the largest in the world.

reserved open spaces or plazas. From the early days of 1535, the growing city passed thru every phase of romance, struggle, and excitement. For 300 years this City of the Kings was the "second metropolis" of Spanish dominion on two continents, and we are told that it was "the center of a viceregal court whose splendor and gayety vied with that of royalty itself."

It was in 1821, after a period of discontent at Spanish rule, and a sharp struggle for liberty, that the independence of Peru was formally proclaimed. In 1823 the first president of Peru was inaugurated. A constitution was adopted providing for the three usual branches of democratic government—legislative, executive, and judicial.

The Municipal Government

Politically, Peru is divided into departments, or states, and provinces, and one of these departments bears the name of Lima; this has an area of more than 13,300 square miles and contains the capital city. Departments are administered by officials called prefects, while subprefects preside over provinces. Districts, cities and towns have officials called gobernadores and alcaldes. Prefects and subprefects are appointed by the President of the republic and are removed at his will.

Early in 1535 Pizarro created the first municipal organization for administering the affairs of the city, and an alcalde, or mayor, was appointed. As the city grew, this branch of administration likewise became of greater importance; but the cabildo form, as it was called, continued in operation through the colonial period, and in fact down to 1857. In this year the cabildo or corporation of Lima became the municipality.

In theory, the municipality has charge of or controls all communal affairs, including the police, public health, opening and paving of streets, water-supply, sidewalks, building regulations, markets, public vehicles, lighting, etc. At the head of Lima's city government is an alcalde, or mayor, and a council. The councilmen, numbering 40, are drawn from the various sections of the city; and by law of 1892 foreigners over 21 years of age, if exercising some trade or profession or owning property, may vote. Councilmen are elected by direct vote of the citizens.

The city of Lima, it will be seen, is not only the capital of the nation, but also the capital of the department of the same name, so that affairs of the republic, of the department, and of the municipality are all administered from Lima. The presence of the President of the republic and the national legislators has a tendency to nationalize and broaden the work and scope of the municipal leaders.

The Sights of the City

Suppose we go sightseeing in Lima. Our start should be made from the Plaza Mayor, a section of the city from which every kind of activity radiates to-day as in the past. This popular meeting ground comprises several acres, and so historical is every foot of space that one is lost in meditation in endeavoring to picture the countless epoch-making scenes that have transpired there. On one side of this plaza stands the massive cathedral with its twin towers, the foundation stones of which Pizarro himself is credited with laying. Near by is the site of the house in which the conqueror breathed his last as the assassin struck the death blow. Within the cathedral to-day the mummy of Pizarro lies, a shriveled but well-preserved figure.

Occupying the entire north side of the Plaza Mayor is the historical palace, a massive but typically low structure with various courts, halls, and many rooms, which formerly housed the viceroys and their official families. To-day the edifice is used for government purposes. With its uniformed sentinels always on duty, it bears a military aspect; the daily guard mount is especially interesting to the stranger. The other sides of the Plaza Mayor are occupied by the City Hall and by business edifices, the lower floors of which serve as shops, restaurants, etc., while the upper stories are utilized by clubs or as private apartments.

The Plaza Mayor is one of Lima's most animated sights day and night. From here the electric cars radiate to every part of the city; here one finds carriages and motor cars for pleasure or for business; amid the beautiful flowers and foliage those who have leisure sit and read the news of the day or listen to the music of the bands; the cathedral and the post office near by draw the citizens by thousands.

Copyright, Newman & Brown & Dawson

THE CATHEDRAL IN LIMA

A short distance away, standing on another attractive plaza known as Bolivar, are the two buildings which house the Peruvian Congress. Especially historic is the senate chamber within the ancient Inquisition building. An interesting modern feature is the use of electricity for voting purposes, whereby a Peruvian senator simply touches a button on his desk and thus registers his vote on a disk near the speaker's table.

In the vicinity of the Plaza Mayor, or not far distant, are many churches and convents, some of the most famous being San Francisco, La Merced, San Agustin and Santo Domingo. The churches of the city number about 67.

A majority of the older residences of Lima are the typical one-story structures, and usually a court is one of the leading features. Opening on this court are the various living, sleeping, and other apartments; while the court itself is adorned with growing plants, flowers, and often a small tree or two. Birds, parrots and other pets are numerous. Barred windows and balconies are common. Many Lima homes of the better classes are two-story structures, and in such cases the balcony overhanging the street offers a fine point from which to view the life of the street when the family is tired of the courtyard and its seclusion.

Educational Institutions

An interesting book could be written about the vicissitudes of the oldest institution of learning in any of the Americas, the famous Universidad de San Marcos. Nearly a century before John Harvard delivered his handful of books in Cambridge to found the first seat of learning in the United States, the professors at San Marcos in Lima had grown old and infirm in educational service. Earthquake and siege have again and again damaged or destroyed the buildings of this institution, but its noble work, started in 1551, continues to the present day, altho modernized, improved, and enlarged in many ways. The university maintains schools of law, medicine, literature, theology and political science. Lima has naturally developed various other colleges which provide courses in engineering, mining, scientific agriculture, military and naval sciences; a recently established school

THE PASEO COLON, LIMA'S MOST BEAUTIFUL AVENUE

of arts and crafts is doing excellent work.

Peru's capital is the home of a national museum, one of the world's most interesting institutions of this nature. It shares with that of Cairo in displaying to modern peoples various incidents of life and activity of by-gone races. Many of the relics are priceless in value, and the vast collection is gradually being enlarged, as ruins in different parts of the republic are excavated and examined.

The City's Business and Pleasure

Lima is not only the political but also the commercial capital of Peru, and many of its business streets always present animated scenes. Large exporting and importing houses have their headquarters in the capital, and these industries draw annually an army of business men from other lands. During a recent normal year, more than 1,400 steam and sailing vessels entered Callao, transporting a vast cargo, much of which was sent farther inland over the railway passing thru Lima en route to the mountains. In return, a vast trade in raw products passes thru Lima to world markets. Lima's cotton, flour, furniture, chocolate, cocaine, boot and shoe, silk, woolen, paper, tanning, and other factories are also contributing extensively to build the trade of the city and suburbs.

The resorts and pleasure parks of the capital are numerous, and there are modern electric lines for reaching them from the heart of the city. Chorrillos, Barranco, Miraflores, La Punta, etc., offer those who love the sea fine opportunities for boating or bathing; and, indeed, a large number of people maintain their permanent homes on or near the Bay of Chorrillos, famous for its regattas and other aquatic sports. On the other hand, when the fogs and mist of winter overhang the coastal region, many citizens of the capital find the sunny climate of Chosica especially appealing; the latter resort lies some 30 miles inland in the Andean foothills and directly on the Oroya Railroad.

Horse racing is one of Lima's popular pastimes from July to December. The Jockey Club is a well-conducted institution and its members are among the leading citizens of Peru. The President and other officials usually attend at least some of the events. The magnificent grand stand has seats for several thousand spectators and is well patronized. The race course is located near the Paseo Colon and measures about 4,900 feet in circumference. The Union Regatta Club is another leading body of younger citizens, which provides pleasures and amusements associated with the summer season at the coastal resorts. There are also foot-ball, tennis, cricket, and various other athletic societies, which number among their members many leading ladies and gentlemen of the capital. On

of the newest and most popular clubs is that devoted to aviation, a science that has already developed a number of famous Peruvian flyers, one of whom, Jorge Chaves, successfully crossed the Alps but gave up his life in accomplishing the feat.

Parks and Boulevards

In 1870 an exposition was held in Lima, and naturally a number of new buildings were constructed in order to provide for exhibits and throngs of people. The name of Exposition Park seems to have become definitely fixed upon this suburb, and today we find that many of the people of wealth and influence have established their homes in that part of Lima. The park itself covers about 30 acres, and is laid out in beautiful walks, artificial lakes, grottoes, flower gardens, and other attractive features. Within the park is also located one of the finest restaurants in the whole city, and it is here in season that many of the exclusive society folk spend their evenings, surrounded by tropical plants and flowers and charmed by the beautiful strains of the orchestral music, a feature of Lima life.

In front of this park the most beautiful avenue of the capital, known as Paseo Colon, has been constructed. It is nearly a mile long, and 150 feet wide, and terminates at the new circle or Plaza Bolognesi. On either side of this avenue many costly residences have been built; along the middle of the avenue from end to end extends a border of flowers, and at intervals stand monuments representing the heroes of Peruvian history. A number of arches are studded with electric bulbs, which render the whole avenue especially attractive at night. On late afternoons and evenings the Paseo Colon is alive with the élite of Lima society; gay parties in motor cars and carriages, and pedestrians are there en masse, moving up and down the Paseo.

Another delightful driveway of Lima is the Avenida de Magdalena, connecting the city and the seaside town of Magdalena, a distance of 3½ miles. This new street is 125 feet wide, and along its route stand fine shade trees; the Avenida de los Descalzas is still another street frequented by the masses, stretching along the Rimac and adorned with beautiful foliage, flowers, marble benches, and grassy plots. Other newer streets and avenues, such as

RUSTIC FOOT-BRIDGE IN EXPOSITION PARK, LIMA

Bolognesi, Grau, Ninth of December, etc., are fast becoming more popular, especially as the motor cars increase in number. In the city proper, there are about 35 public squares formed by the crossing of old and new streets, which offer restful seats or recreation grounds for the public.

WILSON DUMP TRUCK, PERSONALLY PURCHASED BY THE PRESIDENT OF PERU AND GIVEN TO THE CITY OF LIMA

This truck and a sprinkler, also the gift of the President, are being operated by Lima's Street Cleaning Department

General Culture

Lima has a number of societies devoted to scientific research, social and historical questions, literature and art, etc. The famous Geographical Society has done very important work in connection with exploration of Andean ruined cities, map-making, and other lines, and its meetings are a feature of the intellectual life of Lima. Numerous other societies are devoted to medicine, mining, music, engineering, agriculture and allied activities, and as a result of frequent meetings the professional and business men of Lima are brought closely into personal contact and acquaintanceship, an asset of high value to the community.

In the upbuilding of Lima and the whole of Peru too much credit cannot be given to the press. The capital and commercial metropolis is the home of a large number of daily, weekly, and monthly publications, the oldest of which, *El Comercio*, was established in 1839. The leading dailies, of course, receive and publish the cable news from all parts of the world, while correspondents in Peruvian cities and abroad keep their respective journals supplied with the latest happenings. Not only are the journals of Lima published in the language of the country, but there are also certain editions that print columns or pages in other languages, while in recent years several English publications have interpreted Peruvian life and interests to a vast clientèle of readers far beyond the bounds of the country. Lima's various societies also have their official magazines which reflect the activities and progress of their respective bodies.

The City of the Kings has passed, and new Lima is now an accomplished fact. Modernizing influences have been somewhat slower in coming than has been the case with countries receiving annually a large immigration from Europe—in numerous ways an asset, but sometimes a detriment. The world at war is rapidly evolving economic changes. A greater commerce has enabled the city's financial institutions to reflect an increase in various lines of activity, and the universal call for still larger quantities of the raw supplies that lie hidden beneath Peruvian soil foreshadows continued work and inflowing capital.

Block Pavements and Rail Fillers For Car Track Areas

A Comparison of Types and of Their Durability

By John S. Crandell

THE most frequent cause of poor paving in street railway track areas, aside from loose rails and broken joints, is the failure of the rail plaster or filler. Many traction lines fill the space along the web of the rail with cement grout. This too often has insufficient time to set before traffic is turned onto the tracks, with the result that it rapidly crumbles and is no better than so much sand. Other rail fillers have been tried with indifferent success: creosoted planks, bituminous fiber, specially formed brick and other fillers have been given up in favor of grout, and the grout itself has sometimes failed. There is a big field here for study.

Many cities require the same kind of pavement in the track area that is laid on the rest of the street. This is wrong. Sheet pavements have never given good results in this location. A block pavement of some kind is necessary, because the pavement should be one that may be taken up and relaid with the minimum of trouble in order to repair broken joints and bonds. Undoubtedly granite block with a bituminous filler is the cheap-

CEMENT GROUTED SANDSTONE, MILWAUKEE
Broken down along the rails the entire length of street

ASPHALT REPLACED WITH BRICKS, WASHINGTON, D. C.
Constant vibration due to poor track ruins the pavements laid here

est in the long run. Brick has given a good account of itself on medium- and light-traffic streets, and wood block, when properly laid, is very satisfactory.

Engineers have thought that by grouting granite block pavements they would offset any defects in the rail plaster. The illustration from Milwaukee shows that this is not always true. If the rail filler fails, the pavement also fails. The Washington, D. C., photograph shows a street car track area that has been patched and repatched until but little of the original asphalt is in place. It shows how the sheet asphalt broke down when the rail plaster gave way, and how the space left has been patched with brick. It also shows a long crack in the sheet asphalt (at the right), indicating that there is probably a crack directly below this in the concrete base.

RENAPPED GRANITE WITH PITCH AND PEBBLE FILLER, CINCINNATI, OHIO

Repaving in Cincinnati, Ohio, with old blocks that have been renapped is shown in the third picture. The new face is set uppermost and the joints are filled with coal tar pitch and very clean small pebbles. A coating of pitch and pebbles is left on the surface and forms a mat that does not wear off for a year or more. With a pitch and pebble mortar filler a granite block pavement may be removed and replaced at any time that it is necessary to make track repairs.

Wood block pavements have given trouble to street car companies only when the blocks were laid incorrectly. To get the best results, the blocks should be laid on a smooth concrete base that has previously been given a thin paint coat of coal tar pitch. On no account should a sand cushion be used. The joints should then be filled with pitch and the surface given a coating of sharp sand. Bleeding, while disagreeable, is not a bad sign; it shows that there is creosote present in the blocks. However, with properly seasoned and carefully treated blocks there should be scarcely any bleeding. The joints must be made waterproof with pitch, otherwise the water that finds its way under the blocks will cause much trouble.

Brick pavements laid with a pitch-sand mastic, consisting of equal parts of pitch and sand, are very satisfactory and are noticeably more quiet than when the joints are filled with cement grout.

Much of the present poor pavement in the car track area could have been avoided had the proper care been exercised with the rail plaster and had the most suitable pavement been selected and laid with the utmost skill. The pavement in this area receives the hardest wear and is subject to the greatest stress; it should be most conscientiously laid.

MOTOR TRUCK TRAIN RUNNING BETWEEN NEW YORK AND PHILADELPHIA

Using Motor Highways to Meet the War Emergency *

By W. O. Rutherford

WE are beginning to realize more and more what it means to be at war. War devours materials as well as men, and is continually crying for more. In the factory, on the farm, and in the mines, men are working with patriotic zeal, piling up our resources. But factories and farms alone will not give us that increased supply of which we stand in need. Goods must be moved to market before their benefits can be realized. We cannot eat the grain that is a thousand miles away. It is not enough to produce abundantly, it is necessary to transport efficiently as well.

The Motor Truck to the Rescue

In a great national emergency, the railroads have failed. As befits the urgency of the situation, we must find the quickest and most effective remedy.

What is that remedy? *Highway transportation by motor truck, I firmly believe.*

The motor truck to-day is proved to be the Master of the Road. On a good level highway the truck can spin along at a rate of from 20 to 30 miles an hour, or a faster average speed than a freight train. On poor roads it must go slower; but on *any* road where horses and wagons can travel, the motor truck can *get through.* It can go anywhere that roads are—that is the dominant fact in the present situation.

The truck industry itself is rather young. The first trucks were built in 1902 and 1903, but as late as 1910 business men were in doubt about them, and at that time there were only about 9,000 trucks in the country. To-day there are nearly 400,000 upon our highways.

This tremendous fleet of motor vehicles would never have come into existence if it were not that the motor truck has made good in every line of business where the horse was once used. It is crowding him off the city streets, and it is following him to his last stronghold, the farm. And it has made good because it can carry heavier loads and carry them faster than the horse.

In war, too, the motor truck has proved its worth. This is not so strange, for war is business, and, while it is bloody at the front, behind the lines all is efficiency, organization, and dispatch. Transportation spells the success of armies more than ever before, for not only must great bodies of troops be hurried from place to place, but an enormous amount of munitions, equipment, food and engineering material must be transported with haste.

We have an agent of transportation which can haul freight over our highways a distance of 100, 200, 500, even a 1,000 miles. The highways of this country can be made arteries of freight traffic, and it is not impossible that motor trucks swarming over them may, in the not distant future, carry as much freight as our railroads with their restricted mileage, their restricted equipment and terminal facilities.

The examples of long hauling already successfully accomplished are many. There are scarcely any two cities of any size within a hundred miles of each other that are not connected by one or more motor

*From a speech at the recent War Roads Convention, held in Columbus, Ohio.

truck lines. New York and Philadelphia are already connected. New York and Hartford, Conn., Detroit and Pontiac, Olympia and Seattle, Cleveland and Akron —these are just a few. It is planned to connect Cleveland and Toledo, Toledo and Detroit, Toledo and Chicago. Already a line is in operation from Akron to Boston.

Trucks are doing tasks which it was thought could be performed only by railroads. The Cleveland-Akron-Canton Transfer Company operates a fleet of 5-ton trucks over a main line connecting those three cities, and also branches out to Alliance and Youngstown. If you live in Youngstown, for instance, you can have your goods or merchandise hauled in this company's trucks as far as Cleveland. But that is not all. This concern has made arrangements with another truck company, The Highway Transport Company, by which goods can be transferred to their trucks and delivered to points along the Lake Shore Route. For instance, starting at one corner of the map at Youngstown, you can get freight hauled by motor truck as far as Sandusky on the northwest, or Conneaut on the northeast. This case is significant not only because of the distance covered, but because different motor truck companies have here made arrangements to transfer shipments from one to the other in exactly the same way as railroads. Over 200 concerns are already engaged in long-distance hauling as a business. They are in it because they have tried it out and have found that it pays.

Coöperation, Not Competition

At this point, in our enthusiasm for motor trucks and motor transport, we must take care not to underrate the economy or the efficiency of railroad transportation. Imagine, for instance, a freight car loaded with 50 tons of coal going from a Pennsylvania mine to the city of Chicago. It is the most economical means known of transporting that load on land. To give that load of 50 tons to ten 5-ton motor trucks would be uneconomical in the extreme. It is safe to say that trucks could never compete with the railroad under these conditions.

But there is another class of freight business which the railroad cannot handle so well. Imagine a concern, located twenty miles outside of a large city, sending goods either by freight or express to a customer located ten miles out of the city on the line of another railroad! Here are two short hauls, one for each railroad. The consignment goes thru two terminals, and altogether is handled ten or a dozen times before it reaches its destination.

The motor truck, on the other hand, is direct. There is no terminal or transfer depot, but the truck carries its load straight to its destination, with only two handlings, loading and unloading.

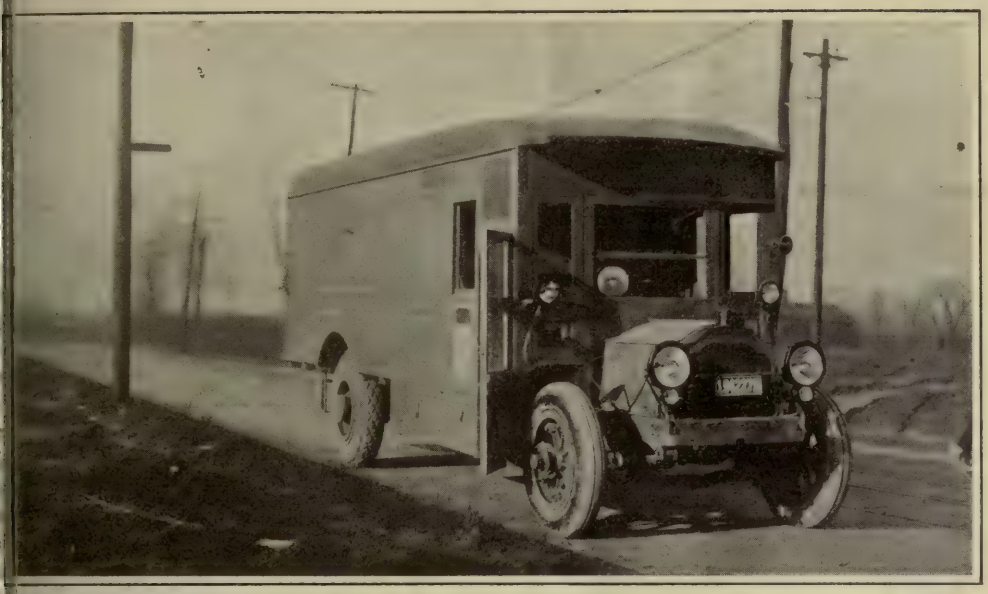
It was a recognition of this fact that led the English Government to fix the hard and fast rule that railroads must not carry freight within a zone of twenty-five miles from the center of such cities as London, Liverpool, Manchester, etc.; freight shipped inside that zone had to go by motor truck. Similar embargoes have been placed on certain Eastern cities, notably New York and Philadelphia, and we may expect to see them imposed on nearly all important cities east of the Mississippi. As far back as September 17 of last year the Adams, Wells Fargo, and American express companies sent out to their patrons a circular signed by their respective vice-presidents requesting that:

> "Motor trucks be used for the shorter-haul traffic in and around the congested districts and that only such shipments for nearby points as actually demand express service be offered to the express companies, so that the traffic requiring expedited service to and from the more distant points may be cared for."

We get from this a clearer idea of the part the motor truck should play in the present emergency. It is one of coöperation rather than competition; a coördination of our highway system with our rail system of transportation.

The Great Need—An Adequate Highway System

What is the urgent need, then, at the present time? Motor trucks we have in abundance—something like 400,000 of them at present, and a production of 300,000 estimated in 1918. *The need is for roads for these trucks to run on—main arteries of traffic between important points.* Without these highways, improved and built to stand truck traffic day in and day out, our plan for meeting the transportation emergency by motor trucks must fall flat.



NE OF THE CROSS-COUNTRY MOTOR TRUCKS OPERATING BETWEEN AKRON AND BOSTON
Showing the excellent road approaching Pittsburgh

The need of good roads everywhere is o apparent, too well-recognized, to require y proof. But the present problem is ich sharper, much more specific. We are cing not a general need, but an emergency. We have only a short time in which t act. We must give up for the moment ose larger plans which cannot be worked ot for ten or a dozen years. In a word, e must build those roads which we have ost urgent need of to-day. These are, thout a doubt, the main highways conecting important cities, railroad centers, d waterways.

No system of connected and coördinated ghways exists. The fleet of army trucks hich made the run from Detroit to the lantic seaboard encountered many and rious difficulties. Altho their route lay ru a highly developed region and passed ru several important cities, it was necesry to spend months in planning the route, investigating reports of road conditions, building gaps in the proposed road, and repairing and strengthening such parts o the road as were impassable for trucks.

This condition, which exists between some our largest northern cities, is repeated erywhere thruout the country. Our highys system has been compared to a crazy ilt, consisting as it does of roads which gin and leave off without order or arrangement, or which are constructed for a few miles of one material and for a few more miles of something else. Often gaps will exist in an important inter-city highway which prevent motor traffic as completely as if no highway existed.

The task before us is one which demands our utmost skill and coöperation. Our skill is demanded, because it is necessary that we build and improve only those roads which are economically essential to the general scheme of highway transportation. Our coöperation is needed because such a program will inevitably awaken local jealousies and strife. But the local point of view must give way to the national, and a master scheme must be evolved which shall meet this emergency as an emergency, and solve it by the most direct means and in the most businesslike way.

So far as that industry is concerned which supplies and equips the vehicles themselves which shall travel on these war highways, it stands ready to provide more trucks than will ever be needed. By the end of this year I look to see 700,000 motor trucks in this country, or about one-third the number of freight cars operated by the entire railroad system. A part of this large fleet, intelligently handled, will be able to take care of that short-haul and package freight which vexes the railroads

and congests the terminals.

But trucks without roads are useless. We must have roads. And we must have them without delay.

They're fighting over in France. We can't hear the guns, and it's sometimes hard for us to realize that we are at war; but on the results of that fight depends no less a thing than our national existence. And if we should not do everything that lies in our power to win the war, we should not be keeping faith with our allies—and our own boys.

We need more ships; but it is not ships alone which carry our resources to soldiers. The big boats which stand at docks are fed by the railroads, and the r roads themselves are fed by our highw In France, when our allies advance, i the road builders who follow close beh and lay down new roads in order that victorious troops may be safe in their r positions. But it is only one more link the chain. The supplies that are rus over the roads in Flanders may h traveled over the roads of Ohio, or India or Texas. To-day *all* roads lead to battlefield.

National and Local Coöperation in Winnin the War

"PUT every dollar to use, put every hand to use, put every acre to use, put every idea to use"—this slogan was suggested to the commercial organizations of the United States by Franklin K. Lane, Secretary of the Interior, who came to Chicago on April 10 to address the annual convention of the Chamber of Commerce of the United States as the personal representative of President Wilson.

"We have come to the time in the history of the world," continued Secretary Lane, "when we understand that such a thing as property exists only because of use. That which you have belongs to me, in the larger sense. That which you have gained out of the community should be so used as to be of service to the community. This nation is the trustee of great ideas for the world. You are trustees of your property for the world. Regard yourself as a trustee, and you will not go astray in the handling of your property."

The adjustment of business to the exigencies of the Government's war needs was the dominant theme of the convention, which was attended by more than three thousand business men and representatives of local organizations from all parts of the United States. Significant of the growing importance of local commercial and civic bodies was the repeated emphasis given at the various sessions of the convention to the achievements and shortcomings of such organizations in their war-time activities.

"To me the highest mission of the Cha ber is to put the soul into business," s R. Goodwin Rhett of Charleston, S. President of the National Chamber, in address on the opening day of the Conv tion. "When we have found out that w is not for the country's good is not for good of business, when we have transmit that creed to our fellow-citizens and m them understand that it is our creed that it should and must be the creed liberty, of agriculture, of the citizenship America, we shall have advanced the h piness and contentment of our people hundred-fold; we shall have placed dem racy upon a broader foundation, and h mounted higher in the scale of civilizatio

Perhaps the most striking feature of convention was the prominence given the labor problem and to the chang point of view of employers towards th employes as a result of war-time velopments. An impressive tribute to workman's part in the winning of the was paid by England's Ambassador to United States, the Earl of Reading, at great mass meeting on Thursday eveni Speaking of labor, the Ambassador sa

"I should like, if I may, to pay tribute the labor of my country. Labor has playe splendid part. It has assisted in the con ence with the Government. It has taken part in the cabinet of our country. It h to rule the country, and it has met every mand which has been made of it. Labo supporting the Government in this war. workman's part becomes very real."

Problems of internal and international mmunication—ships, railroads, electric ilways, motor trucks and highways—ere discussed by the convention at great igth. That the shipbuilding program a local as well as a national problem was e key-note of a ringing challenge to nerican business men by Edward A. lene of Boston, Chairman of the Cham-r's War Shipping Committee.

"There are enough men to talk about the me for causes which the Government n correct," said Mr. Filene. "Let us em-asize the blame that rests upon the com-nities and the business men of these mmunities—and try to find a way to lp."

Roy D. Chapin, Chairman of the High-y Transportation Committee of the ouncil of National Defense, emphasized e new transportation that has come to y its part in carrying the traffic burdens the country. How the motor truck takes e shipment from the producer direct to e consumer, how it makes short hauls in s time than is frequently taken for car itching, how the "Return-Load" bureaus e acting as clearing-houses for both ippers and motor truck owners, were the ints brought out by Mr. Chapin, leading to a demonstration of the part motor cks can play in helping solve the local nsportation problem, and thru it, in a easure, the national problem of food sup-y.

"The 400,000 motor trucks now in ser-ce in this country have sounded the death ell of the short-line railroad," was the atement of F. A. Seiberling, President the Goodyear Tire & Rubber Company, o continued:

"We have approximately 2,500,000 miles of ghways designed to carry traffic as it existed ior to the introduction of the motor truck. requires no stretch of the imagination to ate that within a few years all these roads ll go to the scrap heap. It seems desirable institute at once a separate highway de-rtment in which there will be centralized thority and control, with a view to provid-g roads capable of handling all the tonnage at our motor truck equipment can carry, of lid construction—macadam, hard-surfaced ick, or concrete."

Recognizing the exceptional opportunity hich the convention of the National hamber would give to secretaries of local ganizations to confer among themselves on war-time problems, an all-day conference of the National Association of Commercial Organization Secretaries was held on the third day of the convention. The subjects discussed included chamber of commerce leadership in war work, local industries and the war, financial campaigns and War Chests, stimulating agricultural production and conservation of fuel and food. Especially lively was the discussion on the subject of War Chests.

The N. A. C. O. S., adhering to its settled policy, did not place itself on record in this matter, but the applause which greeted the arguments for and against the War Chest idea indicated a strong preponderance of opinion in favor of the joint method of raising funds for war relief. The National Chamber at its final session went on record in this matter by the adoption of the following resolution:

"*Whereas,* The time has arrived when it is evident that in the interest of unity and for the prevention of fraud and duplication of effort efficient and businesslike methods should be adopted for the work in various communities thruout the country for raising funds in behalf of agencies engaged in legitimate war relief;

"*Therefore be it resolved,* That the Chamber of Commerce of the United States recommends to its constituent members that they use every effort to coördinate such work and to adopt and put into effect at once in their various communities such plans of coöperation as seem most desirable."

Among the other resolutions adopted by the National Chamber, the following paragraphs from that relating to shipbuilding are of special interest to local organizations:

"*Resolved,* That it be recommended to all local business organizations that they take such steps that the shipyards shall have first call upon the best labor and executive ability available in their respective communities, so that in this crisis it cannot be said that private business has better skilled labor or executives than shipyards;

"*Resolved,* That it be recommended to all local business organizations to organize themselves for definite assistance to the ship-builder, or producer of ship parts, in the solution of the problems of housing, local transportation, education, amusements, and other related problems that center in and around the shipyards, thus freeing the time and energy of the ship-builder for the greatest possible concentration upon his sore task of ship-construction."

The election of officers for the ensuing year resulted in the unanimous choice of

Harry A. Wheeler of Chicago as President. Joseph H. DeFrees was reëlected as Vice-President from the Northern Central Division. The three Honorary Vice-Presidents were reëlected, i. e., Hon. Charles Nagel of St. Louis, A. B. Farquhar of York, Pa., and John H. Fahey of Boston, Mass.

R. G. Rhett of Charleston, S. C., who h been previously elected by the Board to vacancy accredited to the Third Distr (South Atlantic States), was elec Honorary Vice-President. John Joy E son, of Washington, D. C., was reëlec Treasurer.

School Work Vital in War-Time

THE war-time policy of the United States Government toward the schools of the nation was outlined in a paper read at the recent meeting of the National Education Association, in Atlantic City, by Philander P. Claxton, United States Commissioner of Education. At the conclusion of the reading of the paper, the Bureau of Education, which had the meeting in charge, unanimously adopted the Federal policy. In part, the statement read:

"The entire spirit of the Administration at Washington is, and has been from the beginning, that the war should in no way be used as an excuse for giving the children of the nation any less education in quantity or quality than they otherwise would have had; but, on the contrary, that the schools should do everything possible to increase their efficiency, to the end that the children now in the schools, at the conclusion of their course, will be better qualified than ever before to take up the duties and responsibilities of life. Both the present demands of the war emergency and the prospective demands of the necessary readjustments inevitably to follow emphasize the need of providing in full measure for the education of the people.

"The President has repeatedly called the attention of the nation to the urgent necessity of this special form of conservation. He has particularly urged young people graduating from the high schools to avail themselves of the opportunities offered by the colleges and technical schools, to the end that the country may not lack an adequate supply of trained men and women, and he assures young people not called to active military service that by pursuing their courses in schools with earnestness and diligence they also are preparing themselves for valuable service to the nation.

"In response to the conviction that the time had come for the formation of a d nite statement of policy with reference the schools in war-time, Secretary L took the initiative in calling a conference representatives of the several departme at Washington most directly concerned the purpose of considering the matter.

"As the result of several conferences statement is recommended to the school ficers and teachers of the country for th careful consideration.

Shortage in Farm Labor

"Before the opening of the war th were in the United States 6,000,000 farm and about an equal number of farm lab ers. In all parts of the country there ex at the present time a serious shortage farm labor. In some places even the fa ers themselves are deserting the farms the high wages offered in near-by cities

"The labor of boys under 14 years of is not a vital factor on the farm. City b without farm experience are not gener useful under 16 years of age. In some li of farm work unskilled boys can be u in part, under skilled direction. In so lines of work, bright, strong boys can in, without previous experience, and be use almost from the first day. There of course, some kinds of farm work tha boy without farm experience cannot be pected to do without training. In any c intelligence, good health and good phys development are essential for useful vice on the farm.

"The army and navy do not want, cannot use, boys under 18 years of age, boys of any age who are not strong well-developed physically. So far as army and navy are concerned, there is n ing more important that the schools ca than to keep going at full capacity, an the same time to emphasize in every

e way their work in physical education. h school boys will render the best ser- of which they are capable by remaining school until the completion of the high ool course.

No Advantage to Shut Schools

There is a strong demand for clerks and ewriters, but the places cannot be filled oys and girls under 18 years of age. No dantage would accrue to the civil service ny way by shutting down the schools. of the conditions thus made vacant must filled from some source. Therefore, ools could undoubtedly render a much- ded service by organizing classes to n stenographers, typewriters, clerks and etaries. Many industries and commer- establishments could use capable boys girls for various kinds of services, but Government officials maintain that no emergency exists which justifies any relaxation of the laws safeguarding the working conditions of young people. Still more serious shortages in labor are anticipated, but boys and girls under 18 years of age should not be used to make up these shortages any more than can possibly be helped. It is easier to provide approved working conditions on the farm than in the mill or factory.

"There appears to be nothing in the present or prospective war emergency to justify any curtailment of elementary school sessions or of the education of pupils under 14 years of age. Teachers and pupils may be encouraged to find ways of performing some service of war value in the schools, such as Junior Red Cross, war garden work, Boy Scouts and war thrift work."

French and Belgian Reconstruction

AS readers of THE AMERICAN CITY know from Mr. Storey's account (September, 1916) of the Exposition La Cité Reconstituée in Paris, the nch are taking the broad view and the og look ahead in planning now for ade- ate reconstruction at the close of the r. How thorogoing these plans are ap- rs in a reprint of "City-Planning Prob- s in the Reconstruction of French wns," a recent article in *Landscape Ar- itecture* by Theodora Kimball, Librarian the School of Landscape Architecture Harvard University.

Thru the courtesy of George B. Ford, w with the American Red Cross in ance, and Dr. James Ford of Harvard, Library of the School of Landscape chitecture has been enabled to secure me exceedingly interesting publications various phases of French reconstruc- n, especially the projected city planning ganization for rebuilding, now established the Loi Cornudet, passed last year. oreover, thru M. Louis van de Swael- n, of the Comité Néerlando-Belge d'Art ique, publications relating to Belgian lanning have also been obtained. The rageous Belgian city planners, some of om are working in England and some in Holland, are aiming at a truly national plan for Belgium. To aid the Comité Néerlando-Belge, the Union Internationale des Villes is collecting all possible data from American city planning experience which would be useful to the Comité in preparing reconstruction plans.

The American representative for the Union Internationale is a committee of the American Society of Landscape Architects, consisting of James Sturgis Pray of Harvard University, Frederick Law Olmsted of Brookline, and, until his recent death, Charles Mulford Robinson of Rochester, N. Y. As a preliminary measure to replanning, the Union Internationale is compiling a monumental encyclopedia and bibliography of city planning, to which the Landscape Architectural Library at Harvard has been able to contribute.

This collection of material on plans for reconstruction is only part of the war-service work of the Harvard School of Landscape Architecture Library, which is generally recognized both here and abroad as having the best collections on the subject of city planning, most completely organized for study and research, and which really serves as a national center of city planning information.

FORWARD STEPS
REPORTED TO THE AMERICAN CITY
BY MUNICIPAL OFFICIALS & DEPARTMENT HEADS

For this department the editors will welcome short articles from city, town and county officials a heads of departments, on subjects of interest and practical value to others engaged in similar work. Pho graphs, plans, or other illustrative material, should accompany the articles whenever available.

CITY MANAGERS

"The Proof of the Pudding is in the Eating"

SAN JOSÉ, CAL.—San José is a city of 40,000 people, lying in the heart of the Santa Clara Valley, one of the most beautiful and productive sections of California. Its wealth is derived largely from the various phases of the fruit industry, and its people are among the most conservative to be found in the Pacific region.

When the San José Charter Committee began its campaign for a modern city charter some time in 1914, it secured the services of Prof. Thomas H. Reed, then teaching municipal government in the University of California, to draft a model charter. After a hard battle, this charter was adopted by the people and went into effect on the first day of July, 1916. In its essential features it practically duplicates the Dayton charter, except that the Council are elected for a six-year term and that the Manager is not subject to popular recall. The author of the charter was chosen first Manager of San José—a unique situation, by which an expert in the field of municipal government was called upon to carry his theories into practical effect.

The first notable achievement of the new administration was the effecting of an arrangement with the First National Bank by which the services of the cashier were supplied to the city as City Treasurer, gratuitously, the bank accepting city deposits and agreeing to pay 2.52 per cent interest on average daily balances. The Deputy Treasurer and License Collector was retained for the purpose of taking care of the collection of licenses and other small accounts. The salary of the City Treasurer hims was saved, and the interest payments, wh aggregated over $3,000 a year, brought net profits of the transaction up to $5, per annum. This is, of course, a continu advantage.

Then came the installation of a mod accounting system. The firm of Hask and Sells was employed to devise this s tem, which gives to the Manager and Council all the information which th charged with the direction of a first-r private corporation have with regard the workings of their organization. connection with the new accounting s tem a thorogoing executive budget introduced, the work of every year be planned in advance by the Manager, s ject to the approval of the Council.

The non-partisan merit system of pointment was put in force under civil s vice regulations. A large number of aminations have been given, and the cit service has been practically removed fr politics. One of the first acts of the M ager was to issue an order to all depa ments forbidding political activity in form.

In the Police Department there has b developed a first-rate identification bure sanitary plumbing has been put into jail, which has been otherwise thoroly r ovated; a night patrol has been est lished in the residence districts, and rig ous suppression of prostitution, gambl and other vices has been carried on.

With the coöperation of the Departm of Health an effective quarantine of persons affected with venereal diseases been established.

The activities of the Health Departm have been quadrupled. At the outse trained Health Officer was secured, an city bacteriologist was employed to as physicians in the diagnosis of contagi

THE ALUM ROCK PARK BATH HOUSE, SAN JOSÉ, CAL.

diseases. Physicians have been required to report as never before, with the result that several threatened epidemics have been strangled in their infancy. Vigorous milk inspection has reduced the average number of bacteria from 800,000 to 93,000 per cubic centimeter. The meat inspection service has resulted in the modernizing of all slaughterhouses, which were formerly in an abominable condition, but which now will compare favorably with any in the state. Only sixty-five houses are now left in the city unconnected with the sewer.

At the Alum Rock Park Bath House, one of the largest and finest bathing establishments in the state, a filter and purification system for the water has been installed, so that bathing is not only attractive but safe.

THE FIRE DEPARTMENT OF SAN JOSÉ
Showing Federal chemical car and hose wagon, American-La France aerial truck, Dodge chief's car, and Seagrave combination

In the Fire Department all call-men have been supplanted by full-time employes; discipline has been improved one hundred per cent; provision has been made for meal hours off and for increased pay; a gymnasium has been installed in the Market Street house; constant inspection of business property has been carried on; and regular meetings for the study of properties subject to fire risk has been established, with the result that the city has the lowest loss ratio, $1.08 per inhabitant, in its history.

The streets have been cleaned, watered and otherwise cared for more satisfactorily than at any previous time. The street sweepers have been outfitted with white uniforms, and more work has been accomplished by less men. A five-year paving program has been inaugurated, which, in spite of war interruption, has already made a fair beginning. The city has paid one-fourth of the cost of constructing the new Willow Street bridge over the Guadalupe Creek, has constructed a concrete culvert to take care of the old Canoas Creek, and has done a great deal of work in repairing bridges and cleaning the creeks, and in other flood prevention work.

By changing the type of street light in the residence district, a saving of $1,584 a year has been achieved without loss in lighting efficiency.

In the relations with public utilities the Manager has been able to secure the Street Railway Company's compliance with its obligation to pave streets. Several miles of tracks, which in July, 1916, stood a foot or a foot and a half above adjacent pavement, have been lowered, and the space between the tracks and two feet on each side thereof has been paved in a satisfactory manner. The Street Railway Company is now engaged in installing heavy Trilby rails on Market Street and in repaving its tracks, while the property owners are resurfacing their portion of the street.

In all this work, centralized purchasing has been employed to great advantage, and the collection of licenses and the accounting for departmental revenues have been put upon a business basis.

The City Manager form of government ended its first year and a half on December 1, 1917, with a balance of $23,000, unincumbered, in the treasury. No public debt has been contracted, and the tax rate f the current year is $1.20 as against $1.2 for the year previous.

It is surprising how every phase of ci activity is speeded up as soon as a sing responsible head is supplied for the mecha ism.

MABEL L. HAMMETT,
Secretary to City Manag

A Fire Department That "Gets There"

San Angelo, Tex.—This is a city about 16,000 inhabitants. We have b one fire station, but since it is centrally l cated and our fire apparatus is all moto ized, we do not feel any pressing need f additional fire stations.

We have no automatic fire alarm syste but during several years past a plan h been worked out by the telephone manag ment and the fire department that h proved very effective and that costs t city—thru the generosity of the telepho company—not a cent.

On the front cover of every telepho directory is printed in red the followin "Report fires to Central, giving exact l cation;" and on the page of instructio inside: "Report fires to Central—not Fire Department—giving the exact loc tion, by street and number, if possib Then remain at telephone till you are su you are understood. And after an alar please refrain for one minute from u necessarily calling Central, as the exchan is busy at that time, notifying firemen."

Practically every alarm comes in fro one of the 1,400 telephones located with the city limits. The operator receiving t alarm calls out to the other operators the room, slowly but in a loud voice that all may hear: "There is a fire at 4 South Adams Street." Distributed abo the switchboard are four typewritten car about the size of postal cards, each givi the day and night telephone addresses about four of the fifteen active fireme On the cards are also listed, with their te phone numbers, the fire station and t water-works pumping station; the latt puts on the high-pressure service a sounds the fire whistle. These two, wi the names of the Fire Chief and the A sistant Fire Chief, are the first names the cards, one to each card, so that th all get the call at about the same time.

Immediately on hearing the alarm given in the room, the other operators begin calling the numbers listed on the cards, saying, when the number called answers, "Tell Mr. Jones that there is a fire at 403 South Adams Street." In a very few seconds—all the operators working together—the 17 to 20 calls have been made, and by the time the fire whistle sounds, most of the firemen are already on the way, from every quarter of the city, with engine throttles wide open and gongs ringing, and with the exact location of the fire known to each.

In another part of the telephone operating room is kept a typed list of the Class D men, or reserves (to be mentioned later), with the instruction that they are to be called only by special request from the fire department in case of large fires.

This constitutes our fire alarm system. It works very smoothly and satisfactorily, and the department is under great obligation to the local telephone company for its generous coöperation.

We have four classes of firemen:

Class A is composed of five men, including the Chief, all fully paid. Except when off duty, they are at the station at all hours, both day and night. Their salaries aggregate $340 monthly.

There are four men in Class B. They answer all day alarms and are required to be at the station between 10 P. M. and 6 A. M.—sleeping there—and to go out with the apparatus on all night alarms. Their pay is $11 per month. Allowing for the regular rotating absences in both these classes, there are never less than six men to go out with the apparatus at any hour of the night.

There are six Class C men. All day and night calls are answered by them from their places of business or their homes. Their pay is $9 per month. Like nearly all the Class B men, most of the Class C men have independent means of gasoline transportation—as, indeed, has almost everybody in this part of the country.

THE SAN ANGELO FIRE DEPARTMENT

Class D is limited to ten members, who are called out only to large fires, under the special alarm system already mentioned, and who receive $2.50 for each fire to which they are called.

Our apparatus consists of one Ahrens-Fox triple combination 750-gallon pumper, one American-LaFrance triple combination 500-gallon pumper, and one chief's car. The heavy pumper weighs 16,000 pounds and responds only to alarms in the business or the industrial district. All alarms from the residence or outlying districts are answered by the lighter pumper. Its weight is but 7,500 pounds, and it is better adapted to quick work over the unpaved streets,

THE FIREMEN'S VEGETABLE GARDEN AND LAWN IN SAN ANGELO, TEX.

which are the rule in the residence districts. In case of large fires anywhere in the city, both pumpers are, of course, brought into service.

We are accumulating an equipment of first-class machine tools and appliances, and our own men are able to do a large part of our repair and upkeep work at the station.

In addition to ample space on the lower floor for the apparatus and the machine shop, there are very commodious quarters for the firemen on the second floor. There are eight three-quarter iron beds in the dormitory, with comfortables, blankets and clean linen always provided. In the firemen's living-room (about 18 x 40 feet) there are individual enamel lockers for the men, a pool table, writing and reading tables, a library, ten or a dozen of the best periodicals, a 100-candle-power reading light, and, when it is cold, a good fire. On the walls are a collection of excellent pictures. Opening from the back of the room are shower and tub baths. A high standard of neatness and cleanness and order prevails. The woodwork is kept varnished, the floors oiled, the windows clear and bright.

Beside the building are two vacant corner lots belonging to the city, which the fire boys have converted into the smoothest and prettiest lawn in the city. On summer evenings they use it as a park and lounging place. Occasionally they light it electrically and invite their mothers, sisters, wives and sweethearts to spend an evening with them, when ice cream and cake are served and a little dancing is enjoyed in the living-room to the music of the phonograph. The City Administration sees nothing but good in innocent pleasure and diversion of this character for its fire boys. Such entertainments are not indiscriminately held, but always with a certain degree of formality and always by prearrangement. A portion of the vacant lot space is given over to the firemen's vegetable garden; it is a "crackerjack" and supplies a number of the firemen and some of their friends.

We have our own gasoline filling station with a capacity of 250 gallons. The amount on hand is never allowed to run below 150 gallons, and this margin is very comforting in time of railroad strikes or other emergencies.

Four fixed drills are held. For variety we change from one to another of these drills, keeping exact time on every step or feature of every drill, from the time the gong sounds, with the men undressed and in bed, to the time when the truck rolls back into the station, with the work all done. Under this plan the men have something to go against in "pulling off" these drills—they are not fighting the air, but going against time, for all the records are preserved, and constant effort is made to improve the time record.

Beside the Department's city map such

questions as this are occasionally posted: "Along what streets would you run, what streets would you cross, and what plug would you tie on if there was a fire at 403 South Adams?" Reviewing and discussing such questions tends to familiarize the men with the locations of all the streets and fire plugs.

We believe that the safest, the cheapest and the best time to put out fires is before they start. The Fire Marshal's inspections are frequent and thoro. The Class A firemen themselves do some periodical inspecting, and report all improper hazards to the Fire Marshal.

During the last year the Chief of the Fire Department answered nearly 300 calls from householders, advising them and assisting them in the correction of flue troubles and other fire hazards. The people understand that an important part of the duties of the Fire Department is to prevent fires and that the services of the Department are freely and cheerfully given to that end.

The ratio of the fire losses paid to insurance premiums received has been less than 30 per cent for the three years ending January 1, 1917, and for the three years ending January 1, 1918. As a result, a Good Fire Record deduction of 15 per cent has been allowed by the State Fire Insurance Commission for policies written in San Angelo during 1917 and 1918.

During the last year ten of the fifteen active members of the Department have volunteered for war service. This has necessitated an almost continuous reorganization during that period. The Department is very proud of its service flag with the ten stars.

E. L. WELLS, JR.,
City Manager.

PARK DEPARTMENTS

A Self-Supporting Municipal Bus Service

Detroit, Mich.—Belle Island is a park two miles long, and seven hundred acres in area, owned by the city of Detroit. It lies in the Detroit River, and is reached by a bridge from the mainland a half mile in length. A web of fourteen and one-half miles of road makes every part of the park accessible to the public.

With the increasing popularity of Belle Isle, horse-drawn phaetons were introduced by the Park Department to transport passengers from the island end of the bridge to the Horticultural Building, the Aquarium and the Zoo, a distance of three-quarters of a mile, and to other points of interest at some distance from the bridge. In 1903 the 13 phaetons then in service carried 349,261 persons.

Encouraged by this success, two automobiles owned by private parties were added to the service in 1904, and the number of passengers was increased to 407,874. The

Courtesy of Packard Motor Car Co.

THE MOTOR BUSSES THAT OPERATE ON BELLE ISLE, DETROIT

next six years saw a steady growth of traffic. In 1910, nine automobiles were in use, and the fate of the phaetons seemed decided.

Two objectionable features of the automobile service became apparent with the increasing patronage of the public. The construction of motor vehicles had not been brought to anything like the perfection of the automobile of to-day. In addition to this, the charter provision for the park department specified that no privilege could be granted to a private concern for a term of more than two years. These two factors conspired to make it impossible to maintain perfect service at all times. However, by 1911 it was generally conceded that the proposition was no longer an experiment, and measures were taken to insure better and more permanent service.

It was decided that Belle Isle's public transportation facilities should be controlled and operated exclusively by the city, and accordingly the arrangement with the private corporation was terminated in the summer of 1911. The horse-drawn phaetons, however, were retained, and two new Packard busses were purchased at a cost of $5,000 each. Nearly a million people were carried that year. The new arrangement has proved to be self-supporting. Ten busses are now in service, operating on a regular schedule. A fare of five cents is charged during the winter months, when traffic conditions are severe. During the summer the rate is reduced to three cents. Employes of the department are carried the year round for one cent each way.

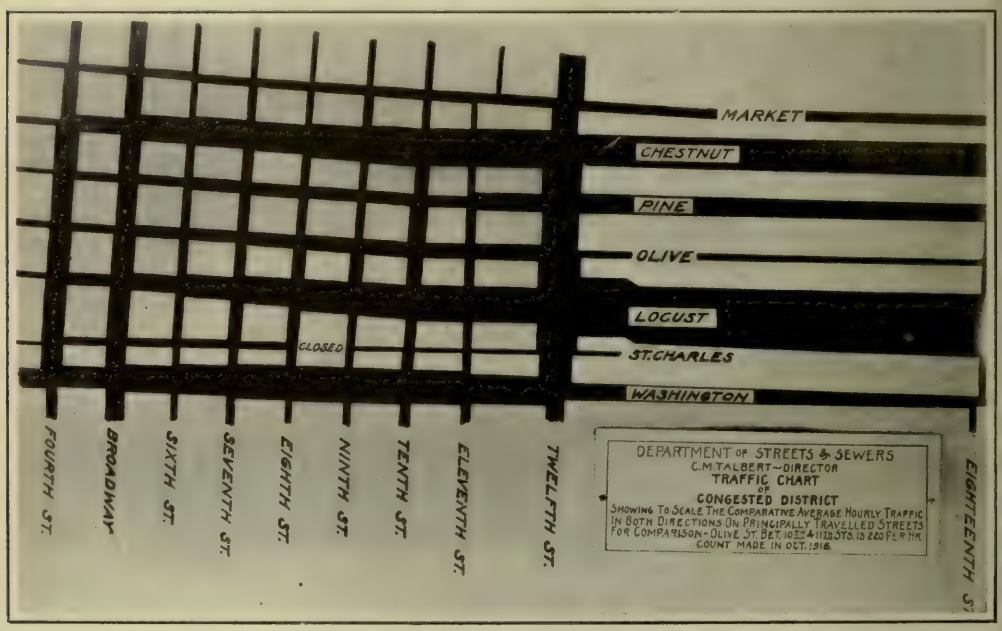
The expenses of maintaining this popular transportation system amount each year to between $17,000 and $20,000. On this outlay an annual return of from $18,000 to $23,000 is realized. Not only has the public been pleased, but from the steadily increasing traffic figures it will readily be seen that the motor service has done much to make the park a popular recreation center for the people of Detroit.

H. W. BUSCH,
Secretary and General Superintendent, Detroit Park Department.

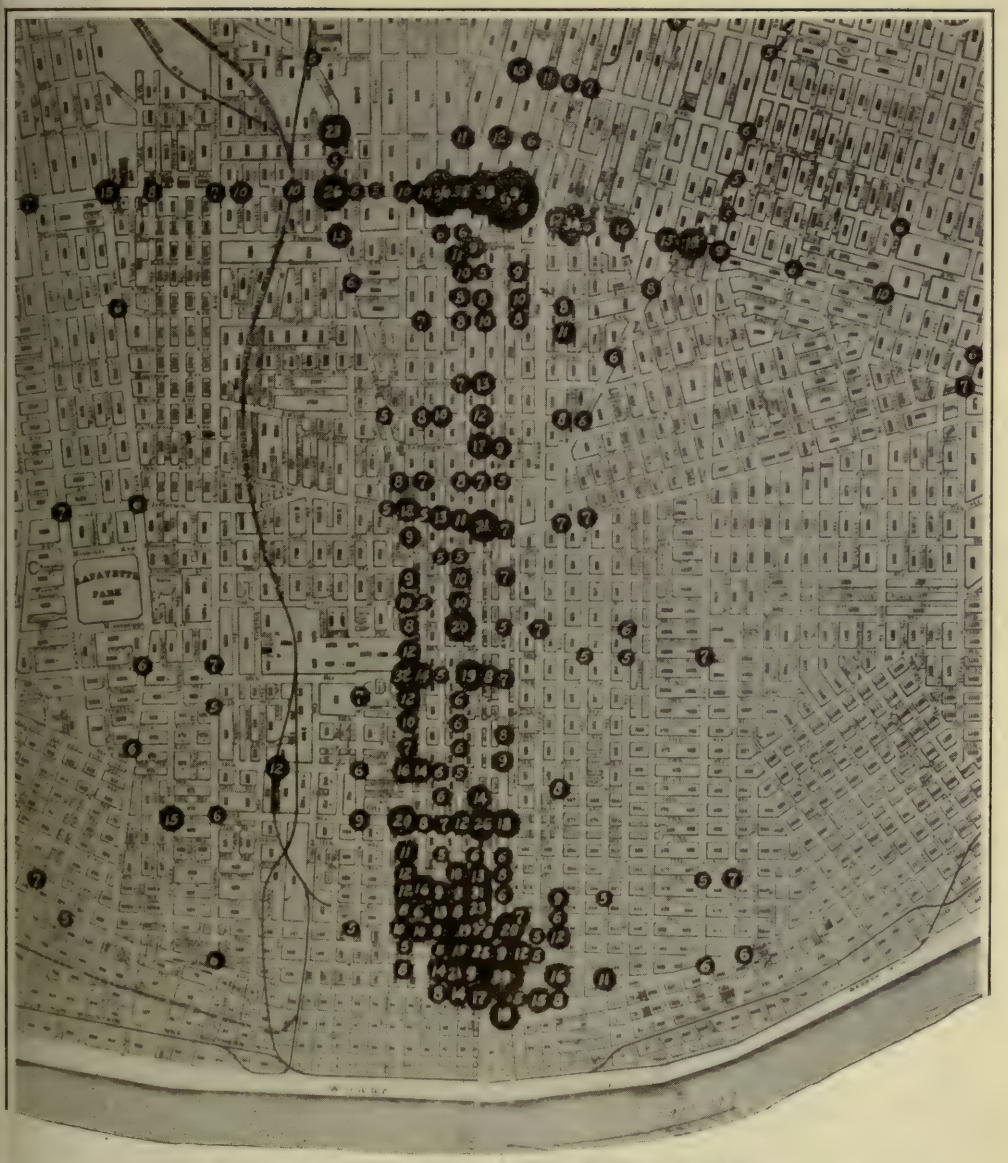
HIGHWAY DEPARTMENTS

An "Accident Map" and Its Uses

St. Louis, Mo.—For years past, as a part of its routine work, the Police Department of this city has made reports and kept records of vehicular accidents on public highways. The street railways company has also kept records of acci-



A SECTION OF THE ST. LOUIS TRAFFIC MAP



A SECTION OF THE ST. LOUIS "ACCIDENT MAP"
The black circles are proportional in size to the number of accidents at the points designated

dents in which its cars were concerned.

When, something over a year ago, we undertook to reduce the number of these accidents and desired to first thoroly understand the existing conditions, it was found that a great deal of work was necessary to tabulate and classify them, as no effort had been made to do this in filing reports. When the tabulating was completed and an attempt made to study it, another trouble was found in the difficulty of vizualizing the number of accidents, the relations of the various critical locations to each other, and the amount and character of traffic. These difficulties were met, at least in a large degree, by the construction of an "accident map" and using it in conjunction with a "traffic map" which had previously been devised in conjunction with traffic study.

The "accident map" (a section of which is herewith reproduced) consists merely of plotting by black circle proportional in size to the number of accidents, all

those points which showed five or more during the year. The limit of five was on the assumption that one or two might occur at any point but that as many as five would undoubtedly mean some local condition of traffic or of physical features that would contribute to collisions. The traffic map will show the exact conditions of the traffic, and an observation on the ground will show the physical features.

As an example, the traffic chart shows more than double the moving vehicles at 18th and Locust Streets than at 18th and Chestnut Streets. The accident chart shows nineteen and fourteen respectively. An examination shows the same physical and street car conditions, except that the intersection of 18th and Locust Streets has a traffic light and a policeman. Their value is obvious.

Other uses of the map readily suggest themselves, such as posting it in police district headquarters so that patrolmen may note the dangerous points and give them special attention; furnishing motormen on street cars with a route map showing in some striking manner the dangerous points; and erecting warning or caution signs for autoists.

Among the physical remedies have been the rounding of sharp curves by moving the curb; relocation of traffic lights; changing crown of street or character of pavement; increased street lighting and placing of spot lights for illuminating center of intersection.

C. M. TALBERT,
Director, Department of Streets and Sewers.

Editorial Note.—The National Safety Council will hold its annual convention in St. Louis in October. It is planned to make the Public Safety Section, of which Mr. Talbert is Chairman, one of the features of this gathering. Inquiries for information should be addressed to Mr. Talbert, at St. Louis.

PUBLIC WORKS DEPARTMENTS

The Garbage Can as a Food Conservation Witness

St. Paul, Minn.—A comparison of the garbage collections in this city for 1916 and for 1917 are of interest from the viewpoint of food conservation. We are all familiar with the story of the family that had such "swell swill," and we are glad to note that distinction is now being sought by efforts to keep the garbage can as nearly empty as possible.

For the seven months beginning with June and ending with December, the record of garbage collections in St. Paul is as follows:

In 1916..... 11,617 tons
In 1917..... 9,740 tons

Prior to June, 1917, there was no particular difference between the records for the two years, for people did not begin to "Hooverize" until the Government had taken steps to educate them in this respect. The above figures indicate a reduction of more than 16 per cent in garbage collections.

M. N. GOSS,
Commissioner of Public Works.

Waste Reduction in Milwaukee

Milwaukee, Wis.—Here is an actual, concrete and unmistakable evidence of food conservation. Milwaukee's mixed refuse collection in 1917 was smaller than in any other year since the incinerator was constructed. So little refuse was furnished to the incinerator that not enough steam was generated to operate continuously the Milwaukee River flushing pumps, and it was necessary to buy electricity to keep the flushing works in operation. The cost of operation for the year was $72,079.07, against $64,238.46 in 1916—an increase of $7,840.61.

The following statement of tons of garbage collected during 1917 compared with the tonnage collected during 1916 shows that our people are trying to practice the "gospel of the clean plate":

Year 1916	Tons	Year 1917	Tons
January	2,770	January	2,173
February	2,336	February	1,795
March	2,795	March	2,109
April	2,656	April	2,269
May	3,426	May	2,319
June	3,604	June	2,680
July	3,825	July	3,104
August	4,145	August	3,346
September	3,870	September	3,072
October	3,422	October	3,259
November	2,654	November	2,443
December	2,636	December	2,275
Total	37,939	Total	30,844

We hire contract labor—man, horse, harness and running gear—the city furnishing a two-yard water-tight metal box and canvas cover. At the incinerator plant there are four electric hoists with spread chains that go over the box and attach to two metal lugs on each side, lifting the box to the third story and depositing its contents in concrete bins. This garbage is mixed with household ashes and put into charging chutes to the fire below.

CHARLES O. DAVIS,
Superintendent of Street Sanitation.

- WATER - DEPARTMENTS

An Air-Lift Water-Supply System and a Municipal Light and Power Plant

Kaukauna, Wis.—The accompanying view shows the pumping station in Kaukauna. The equipment of this station consists of one 1,500,000-gallon Deane of Holyoke tandem compound steam pump, used in emergency only, one single-stage, 1,000-gallon-per-minute, 50-h.p. Worthington centrifugal pump, and one two-stage, 1,000-gallon-per-minute, 100-h.p. Worthington Underwriters pump. These two electric pumps are controlled from our electric power station, and both motors are 2,300-volt, dispensing with the use of transformers.

Our system is the stand-pipe system, with a remote-control valve of the Engberg make, which also is operated from our electric power station, where all fire calls are brought in electrically and where all records of pressure are kept.

We have three 8-inch flowing wells of an average depth of 800 feet, which flow into a reservoir of 300,000 gallons capacity. During the last two years there has been a gradual falling off in the natural delivery of these wells, and after a thoro investigation it was decided to install an air-lift system to take care of our water-supply. The system was furnished complete by the Sullivan Machinery Company, and it cost, including installation, $1,800. The equipment is guaranteed to deliver 500 gallons per minute, or about three times the amount of the present consumption. It has now been in operation for three months, and has proved very satisfactory. The machinery is used only four hours a day, and its operation is adequately handled by the regular force. We are able to keep the reservoirs filled to the required 300,000-gallon mark, thus meeting all the demands of consumers and giving the city better fire protection than it had ever had before. The quality of the water for drinking purposes is also greatly improved by aeration. We are now entirely independent of the Fox River, from which we shall never have to draw. The entire work of installation was done by the water-works force, and a little 25-h.p. motor is sufficient to operate the mechanism.

This city also owns and operates its 4,200-h.p. hydro-electric station, and sells power for all classes of business, both large and small. We are operating some installations as high as 1,000 k.w. connected load, but we do not confine ourselves to the limits of the city of Kaukauna; we are furnishing all of the service in the village of Little Chute, with a population of 2,000, and the Combined Locks Paper Company, over 3-mile, 11,000-volt transmission. We also cover considerable area in the farming districts, and we have at present about

THE PUMPING STATION AT KAUKAUNA, WIS.

1,100 customers. The following schedule shows our reasonable rates for electric light and power:

Commercial Lighting

Schedule A. 115-volt single-phase service.

	Per K.W.H.
First 100 K.W hrs. per month	$.09
Next 100 K.W. hrs. per month	.06
Next 400 K.W. hrs. per month	.05
All over 600 K.W. hrs. per month	.045

Minimum charge for each meter connected, $1.00 per month. All less 5 per cent if paid within ten days from date of bill.

Commercial Power

Schedule B. Three-phase, 60-cycle, 230-volt service

	Per K.W.H
First 100 K.W. hrs. per month	$.07
Next 200 K.W. hrs. per month	.05
Next 200 K.W. hrs. per month	.04
All over 500 K.W. hrs. per month	.03

Minimum charge of $1.00 for the first horse-power or fraction thereof of connected load, and 50 cents per horse-power for each additional horse-power or fraction thereof of connected load.

All less 5 per cent if paid within ten days from date of bill.

Schedule C. No discount. Not less than two-year contract for 200 H.P. of connected load or over.

	Per K.W.H
Less than 50 hours, maximum demand	$.03
50 to 100 hours monthly, maximum demand	.02
100 to 200 hours monthly, maximum demand	.015
200 to 300 hours monthly, maximum demand	.013
300 to 400 hours monthly, maximum demand	.012
400 to 500 hours monthly, maximum demand	.011
500 to 600 hours monthly, maximum demand	.01
600 to 700 hours monthly, maximum demand	.009
700 and above hours monthly, maximum demand	.008

The maximum demand to be the maximum load thrown on the Power Company system continuously for a period of one-half hour; this demand to be determined from time to time by tests with curve-drawing water meter or other suitable instrument.

Minimum charge 50 cents per horse-power or fraction thereof per month connected load when current consumption shall produce a less total amount.

Under the above rates no free lamp renewals will be made, but all lamps will be sold at cost.

Electric Cooking Rate

Schedule E. 230-volt service

	Per K.W.H
First 100 K.W.H. per month	$.04
Next 200 K.W.H. per month	.03
All over 300 K.W.H. per month	.02

Minimum charge for each meter connected, $1.00 per month. All less 5 per cent if paid within ten days from date of bill.

Electric Water Heating Rate

Schedule F. 230-volt service. No cash discount. No meter.

$5.00 per K.W. of connected load per month.

Minimum charge, $3.00 per month.

WILLIAM B. MONTGOMERY,
Manager, Electrical and Water Departments.

EDUCATION - DEPARTMENTS

Breaking Away from Tradition in School Work

SACRAMENTO, CAL.—It is becoming well established thruout the country that eight years of school work devoted to fundamentals is too long. It has been fairly well determined that in the first six grades enough preparation can be given so that the child may differentiate somewhat in accordance with his ability and capacity in the next two, thus leaving the grades above open to work tending to much broader training than has been given in the past.

In Sacramento we are slowly and carefully working out a scheme for a basic six years. We divide the remaining eight years in groups of two; in the seventh and eighth we use departmental teaching; the ninth and tenth we call the Junior High School; the eleventh and twelfth the Senior High School, and the thirteenth and fourteenth the Junior College. We believe, however, that it is not enough to simply say that the first six years are basic; we must make them so. This means many changes in the course of study, a reduction in the amount of material presented, the establishment of minimums, and the cutting away of much extraneous material. It will mean the rewriting of most of our text-books.

The separation of the first two years of the high school from the main building, and the placing of these children in junior high schools located conveniently in different parts of the city, has a sound sociological basis. It has been proved that these young people do better work thru this change; they take a greater interest in their work. They are just passing, or have recently passed, the adolescent period; they are great imitators; when thrown together in one building with the two upper grades of the high school, they associate immediately with young men and young women who love to be imitated and who very often show these younger people only the superficial side of school life.

A REAR VIEW OF THE WILLIAM LAND SCHOOL IN SACRAMENTO

CHILDREN SALUTING THE FLAG IN THE INNER COURT OF THE WILLIAM LAND SCHOOL, SACRAMENTO

The upper group of the high school, or the Senior High School, is composed of students who are practically men and women. They have different ideals of work from those who are younger, and should be taught differently. They can be safely placed with the Junior College students, and this plan we are following out in our department. The differences are not so great among pupils from 17 to 20 years of age. The results of the establishment of the junior high schools have more than met our expectations during the past year.

We are using many of our school buildings day and night. We are throwing them open to all kinds of activities under the civic center law. We have evening classes for those who have failed to accept early opportunities; we have classes for foreigners training for citizenship. We have afternoon classes for mothers, in millinery and sewing, and we are endeavoring to make each classroom give the most possible service.

The companion class plan is in operation in several of our buildings. This allows us to make double use of each classroom, but its greater value lies in that each subject is taught in the atmosphere of the subject, by providing special rooms for the purpose. Our new William Land Building is built ideally for this work, but we are more interested in making the plan work in the older buildings, which we shall have with us for a number of years to come. The child shows increased interest in doing his work in a room properly equipped. The shifting from one classroom to another gives him physical and mental relief. The teacher becomes a class teacher and not a classroom teacher.

In working out the idea that the conventional classroom was built and equipped for conventional subjects and that the special subjects have been forced into a type of classroom not entirely fit for the work they represent, it was found that the conventional classroom would be out of use a part of the time. The problem then was to put these vacant classrooms at work. Our kindergarten rooms are large and pleasant and each afternoon become the music rooms. We take any space we can find and make of it a science room; it may be in the basement if no other space is available. The class can spend one hour a week in such a room, where we should not want it to spend five hours a day five days in the week. We find a room for the drawing. The physical training work is done in the yard, in the basement, or in a gymnasium, if we have one. The children go

to the manual training room for that subject, and the stories are told in a story corner or out under a tree.

Our old buildings and the rapid growth of the schools have made it necessary for us to build portable buildings. We have 58 of these in use. They are practically open-air classrooms. For material and labor, they cost $250 apiece.

Here are a few other forward steps which the department has taken. We find that in smaller classes and in single sections we can demand a closer study of pupils by the teachers. Supervised study with less time given to recitations is having an important civic bearing in the results attained by establishing responsible, independent methods of work. We are doing away with the great pell-mell recess. When play time comes, the teacher goes with her class, becoming acquainted with them in their play as well as in their work. The old type of examination is eliminated entirely. Promotion is based upon a three-fold judgment, with the teacher as the judge, of the child's daily recitations, his written work, and, most important of all, his effort. Continuous-record cards follow the pupil thru his years of elementary training and enable the teacher to know the work of the years preceding her grade. These cards are of great aid in guiding the child to discover himself—to find the walk of life that he is best suited to follow. We are doing away with the unsanitary blackboard. All of our buildings are equipped for moving pictures; aside from stationary machines, we have a portable machine and a man who devotes all of his time to this work.

These are some of the ways in which we are trying to express the greater meaning which every school building should have to-day as a community center.

CHARLES C. HUGHES,
City Superintendent of Schools.

FIRE DEPARTMENTS

The First Motorized Fire Department in Utah

Ogden, Utah.—The Fire Department of Ogden was the first in the state of Utah to become motorized. In 1916, there were two horse-drawn pieces of apparatus in service, and these have since been replaced with motors, so that the Department is now completely equipped with modern apparatus. We have in service four American-LaFrance combination cars, one of them a 750-gallon pumper, one 65-foot American-LaFrance ladder truck, one double 60-gallon chemical, one chief's car—a 6-cylinder Buick roadster—and one Ford truck, used as a line car for fire alarm

THE COMPLETELY MOTORIZED FIRE DEPARTMENT OF OGDEN, UTAH

work. The accompanying photograph shows our fleet, except the chemical, which was in the paint shop when the picture was taken. There are three fire stations in the city—the headquarters as shown in the view, and two bungalow stations for five-men companies.

In 1917 we had 173 fires and used water on 48 of them; on 26 of the 48 we used both chemical and water, and 125 fires were extinguished by chemical alone.

The modernizing of the department has had excellent results, as shown in the fire loss record. In this city of 16½ square miles, with a population of 34,000, the average fire loss for the six years from 1910 to 1916 was $93,871.92. In 1916, the loss was $58,832.21, and in 1917 it was $29,566.89.

G. A. GRAVES,
Chief of Fire Department.

HEALTH DEPARTMENTS

"Spitless Day" in Chicago

Chicago, Ill.—Later developments in our anti-spitting crusade* have been of great interest.

At a conference held in the Department of Health, at which the Police Department and other organizations were represented, it was agreed that the spitting ordinance should be rigidly enforced. Those present were of the opinion, however, that it would not be practicable to make arrests every day; both the Chief Justice of the Municipal Court and the Chief of Police agreed that it would result in too great crowding of the Police Department and the Courts. It was then decided that we have one day a week set aside for arresting spitters, the Chief of Police to name the day, and that it should not be generally known in advance.

This program was carried out, and spitters were arrested and taken into court. Practically all pleaded guilty and were required to pay a nominal fee. On a recent occasion those arrested were dismissed thru the Judge's chambers. There we had arranged three microscopes with a slide in each, one showing tuberculosis, one meningitis, and one pneumonia germs. Each spitter was required to look thru these microscopes and to identify the germs. He was informed that his sputum might contain similar germs. He was also told that the pneumonia germ, or "pneumonia crook," had killed 5,000 people in Chicago last year, the tuberculosis germ 3,600, and the meningitis germ, while it had not killed so many, had been a great menace to the United States Government at the cantonments. He was asked to "do his bit" by keeping the law.

The result has been a very evident difference in the condition of the streets of Chicago. Our campaign, however, has only begun.

JOHN DILL ROBERTSON, M. D.,
Commissioner of Health.

*See The American City, March, 1918, page 237.

A Municipal Drug Addict Clinic

Newark, N. J.—The supervision of the drug addict, altho well-known as a problem involving very considerably the health of the population and also having a moral and ethical side, has not heretofore, it is believed, been made an activity of a municipal department of health. There has seemed to be no authority exerting any centralizing supervision over the persons who are victims of this affliction. The Department of Health of Newark has seen the necessity of taking steps to act as an advisory body in the treatment of these unfortunates.

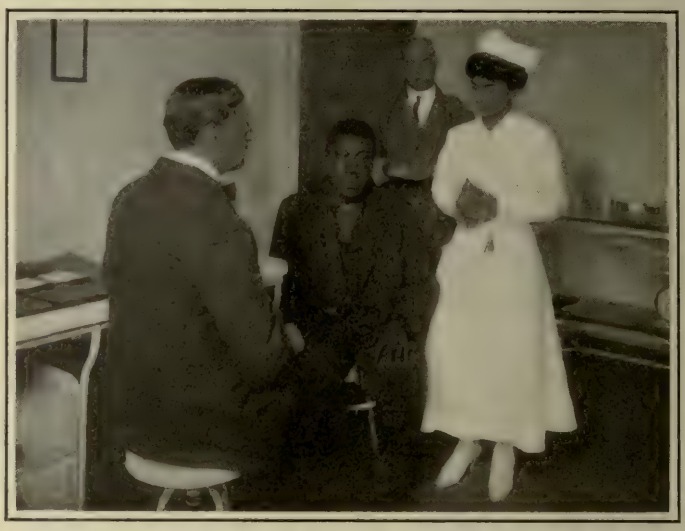
First and foremost in any supervision of these people is the necessary provision of a place where the victim may be brought face to face with the expert upon remedial measures for this condition. It appeared to us that the best way to reach the addict was by means of a free addict clinic, and this has been recently established in the dispensary carried on by the Department of Health of the city of Newark.

The clinic is held three times a week. It is free to all sufferers from narcotic addiction. and actual treatment is given. The clinic is in charge of Dr. Charles A. Rosewater and has already given promise of being one of the most valuable of our health and social activities. Dr. Rosewater states that "all the patients who have applied for treatment impressed one as being sincere in the expressed desire to over-

come their affliction. A few triflers have appeared, but these soon retired upon learning that neither heroin, cocaine, nor hypodermic medication was obtainable. The theory underlying the principles here given is that the drug addict is suffering from a chronic toxemia, the toxic agents being the uneliminated products of his perverted metabolism, plus the decomposition products of the drug taken. The aim of treatment is to withdraw the accustomed drug with a minimum of distress, in order to make possible the restoration to health without necessitating physical restraint, by the substitution of a milder narcotic, rapid reduction in dose and dilution of the toxic agents and their elimination."

Dr. Rosewater has observed that the drug addict will be educated into the fact that an addict is curable without undergoing a long reduction treatment with the same dope that he has been in the habit of taking in enormous quantities. The coöperation of the Police Department has been obtained in the endeavors to bring drug addicts to the clinic, and an active campaign has been instituted and will be carried out against those persons who are found to be supplying drug addicts with cocaine, heroin and morphine. There can be no question that the activities of the Department of Health must proceed along the lines where an effort can be made to reduce the opportunities for undermining the public health. There is no greater menace to the health of our young people than drug addiction, and we will by means of our clinic institute a campaign of education among these people.

There should be no limit to the assistance given by a municipality in such a course. The expense of our clinic has been infinitesimal compared with the ultimate good which will be obtained. Formerly there was no place where people afflicted with the drug habit could go for regular treatment. The average practitioner has no special knowledge of the methods whereby these cases should be treated, and very frequently they fall into the hands of low-class persons, including even some physicians who will commercialize their distress and squeeze all available cash from them, after which they are allowed to exist as destitute drug addicts obtaining their living by criminal procedures. The next few months, will, of course, show how far we may hope for definite progress in checking the drug addict traffic, but present experience shows that we are on the right lines in meeting a situation not formerly recognized as a definite activity of a department of health.



A SCENE IN THE DRUG ADDICT CLINIC, NEWARK, N. J.

The clinic meets on Monday, Wednesday and Friday at 3 o'clock. Both sexes are received, and both white and colored people are accepted for treatment, and where a case warrants hospital treatment such is provided.

It is in contemplation that employment shall eventually be found for some of these persons upon farms where their special failing can be adequately supervised by persons of repute. It may eventually be possible to provide a farm school or a special institution where they can make their own living while under supervision of our Department officials.

C. V. CRASTER, M. D.,
Health Officer.

The New Lighting System in Los Angeles, Cal.

By Morris M. Rathbun
Los Angeles Chamber of Commerce

THE above photograph shows a portion of Broadway, Los Angeles, as it will appear after the installation of the new lighting system recently authorized by the City Council for prompt completion. Twelve blocks in the heart of the city will be illuminated as shown in the picture. The electroliers will be 100 feet apart on each side of the street. Each will be 27 feet high and will have an illumination of approximately 3,200 candle-power. The cost of installation will be about $100,000. The claim is made that when these lights are installed this section of Broadway will be the most brilliantly illuminated street in the United States. Altho the light power is not the greatest, the added brilliancy will be due to the fact that most of the buildings flanking the street are white, giving a maximum reflecting power.

Educate All in "Safety First"

By Sebert T. Friedrich

Deputy Commissioner, Department of Public Safety, Syracuse, N. Y.

THE Department of Public Safety of Syracuse, comprising the Bureaus of Fire, Police, Health, Building, and Gas and Electricity, has maintained for some time a continual program of education for its citizens in matters dealing with making the city safer, more healthful and less wasteful.

Two years ago the Mayor appointed a Safety First Commission consisting of many of the prominent men of the city interested in large industries, and especially of those who had control over many of the teams and trucks comprising a goodly portion of the city's traffic. Among the men appointed were coal dealers, members of trucking firms, manufacturing plant managers and superintendents, railroad officials, and the president of the local automobile club, with the officers of the Department of Public Safety. For a time, during the institution of the campaign, this committee met weekly, but now that the work is better organized it meets only at the call of the chairman.

Specially adapted literature has been the chief means of educating the citizens and children in these matters of vital importance. Among the small pamphlets which have been issued in this connection from time to time are "Don'ts for Mothers," "Don'ts for Pedestrians," "Don'ts for Autoists, Bicyclists and Motorcyclists," "How to Handle Gasoline," "Hazards to Workmen in Factories," and special booklets on the installation of gasoline tanks, the handling of dynamite, gunpowder and all other explosives, a sane Fourth of July circular, and information relating to the regulation of motion picture shows. These booklets and other literature are distributed thru the Public Library and thru semi-public organizations thruout the city.

The most general distribution, however, is thru the schools. A sufficient number of the booklets to be distributed are sent to each school so that every pupil may receive

DRIVE CAREFULLY

"Traffic ordinances are made to safeguard the lives of the citizens of the city of Syracuse by reducing the possibility of accidents. Drivers and pedestrians are daily jeopardizing their own safety and the safety of others by violating these ordinances. Let us join hands and aid the city officials by coöperating and complying with the regulations of the Traffic Ordinance."

one as he leaves the schoolroom at noon. The children read them on the way home, and the booklets are then more likely to reach the adults and be read by them, for children usually go home quicker at noon than at night, at which time there is a tendency to play a bit. The booklets which we want to have reach the parents are more likely to be lost in the playtime than when the children are hurrying home for the noon lunch.

At the camp of the Syracuse Council of Boy Scouts of America we distributed, at the request of the officers, a large number of the booklets; the subjects were thoroly treated in talks and the boys were given tests on the various topics.

Caution—Absent
Obstruction—Present
Accident—Coming

Thru the Building Bureau all garages are fully inspected when they are under construction, to see that they conform to the regulations both as to construction and as to the storage of gasoline. After the garages are in use, the Fire Bureau makes regular inspections to see that the regulations are still being satisfactorily carried out. Both business places and factories are inspected for faulty construction which might lead to serious fires and for the purpose of giving advice to employes and employers on precautionary measures for their mutual protection. Six or eight men are daily employed on this inspection work thruout the year.

The department practices what it preaches. The fire department is now about three-quarters motorized. In strict obedience with the regulations, no gasoline is stored on the premises, but every bit is kept in buried safety tanks. We permit no gasoline to be used in the fire houses for cleaning purposes, and never allow the gasoline supply tank to be opened indoors; the apparatus must be driven out into the open to be filled. Safety cans are used to carry gasoline from the pump to the apparatus.

Each fire company and every police station is equipped with a complete "first aid" cabinet, and the surgeons of both services have instructed all men in their departments so that everyone is efficient in first aid relief. Another item in connection with our fire department which, on the face of it, seems rather insignificant, is the including of a Pyrene extinguisher in the equipment of every piece of apparatus. There are many instances when the apparatus is called out on an alarm to extinguish an automobile fire. Without such a piece of equipment the apparatus is helpless in dealing with gasoline fires, while its inclusion has saved much valuable property and in several instances the lives of the occupants of the machines.

No explosives are permitted to be sold or transported thru the city without a special permit.

The experience of our police department has shown the effectiveness of the safety work which has been instituted and has further indicated that much of the trouble which leads to arrests is due to careless-

DEPARTMENT OF PUBLIC SAFETY
BUREAU OF POLICE

Please call on Chief of Police M. L. Cadin, at Police Headquarters, at Ten o'clock A. M., ... 191...., regarding violation of Traffic / City ordinances called to your attention.

Car Number.....

OFFICER

Name.....

Ordered to Report to Chief .....

Car Number..... Make of Car.....

Violation.....

.....

OFFICER

SUMMONS FOR TRAFFIC OFFENDERS IN SYRACUSE

ness. Much more has been accomplished in the way of effective enforcement of ordinances for the safety of the public thru heart-to-heart talks and proper reprimands by the chief of police among the best citizens than by causing arrests. The card shown herewith has, thru its courteous spirit, been a means of transforming reckless automobilists into safe drivers. The upper part of the card is made out by the officer who observes the infringement of traffic or city ordinance, and is either given to the driver or else left in his car if he is absent. The lower section is turned in to the Chief of Police, that he may know what drivers are expected to report to him and for what cause. The card amounts to a polite court summons, but does not entail an actual appearance at court; it is rather a rational discussion with the chief, the result usually being that the driver departs on friendly terms and with a resolve that he will not be guilty of infringing the ordinance again.

In connection with the Bureau of Health, we had a float in the last Municipal Day parade showing the old and the new drinking fountains. The old oaken bucket—the germ-laden bucket—was shown at one end of the float, and the modern bubbling fountain was seen at the other end. This Bureau is, furthermore, very active in its distribution of "No Spitting" and "No Smoking" signs thruout the city.

The photographs shown with this article are from our latest "Safety First" booklet, copies of which will gladly be sent to other cities which wish further information as to the active work carried on by this department with the coöperation of the municipal officials and the Safety First Commission.

"The King Can Do No Wrong"

Shall Our Parks Be Made Safe for the Public?

By Robert Emmet Tracy

Director, Indianapolis Bureau of Governmental Research

KINGS and emperors seem to be no longer *au fait*. In all of the liberal countries of the world they are either dispensed with or are retained only for old times' sake. Nevertheless, some of the ancient regal theories still stick on pertinaciously, even though furtively and traditionally, imbedded in the common law, which has not always been on the closest speaking terms with the common people. The evolution of popular government has been extremely slow, and in some quarters painful. What is going on in Russia to-day and what may go on in Germany to-morrow only shows that government by the people, whether for the people or not, is a comparatively new phenomenon in the universe.

One of the legal principles probably developed from this old divine right of kings is the exemption of municipalities from liability for negligence in the performance of governmental functions as distinguished from corporate or proprietary functions when the city would be acting as any other owner or proprietor. Of course, cities are made liable by statute, and, as a matter of fact, cities are generally responsible for the care and condition of the streets because, usually by statute, they have exclusive control.

There is an interesting line of cases relating to parks and recreational facilities wherein almost invariably the city has not been held liable for the negligence of its servants. Massachusetts courts have adopted a very strict rule in this regard, as in the case of Bolster v. City of Lawrence, 114 N. E. 722, in which a public bath house and its approaches gave way as the result of the city's negligence, and several lives were lost. The court said that the possibility of a small charge did not affect the public character of the baths, which were for the benefit of all. "The difficulty lies not in the statement of the governing principles of law, but in their application to particular facts. The unchanging test is whether the act is for the common good of all without the element of special corporate benefit or pecuniary profit."

The courts following the Massachusetts rule * refuse to hold the city liable except where the liability is imposed by statute. The other rule† is much more lenient and liberal in these cases, and is inclined to hold the city responsible wherever there is serious question that the city is not acting in its governmental capacity.

In the recent case of Robbins v. Omaha, 160 N. W. 749, a boy of 9 was drowned in an artificial pool in an undeveloped part of a park. Altho the caretaker saw the boy in a dangerous position, he did nothing. The court decided that a good cause of action was not stated because the pool and the raft did not constitute a nuisance. One judge disagreed with the ruling, saying that unless the city was performing a governmental function, Mr. Robbins stated a good case. Courts have held that a city shall not maintain an attractive nuisance, and this seems like such a situation.

In Hibbard v. Wichita, 159 Pacific 399, small children were bitten by coyotes confined in cages in the city's zoölogical garden. The children had been allowed by their parents to stray, but, at the same time, the animals were not confined as safely as they might have been. The lower court gave a judgment for $500; but the upper court decided that the city was not liable, since it was acting in its governmental capacity. Here, too, one judge felt that the municipality should be liable for maintaining a nuisance, saying: "The coyote cage was a most malignant and excuseless attraction.

---

* Louisville Park Commissioners v. Prinz, 127 Ky. 460. Clark v. Waltham, 128 Mass. 567. Steele v. Boston, 128 Mass. 583. Blair v. Granger, 24 R. I. 17. Russell v. Tacoma, 8 Wash. 156. Sheehan v. Boston, 171 Mass. 296. Bisbing v. Asbury Park, 80 N. J. L. 416.

† Pennell v. Wilmington, 7 Penn. (Del.) 229. Bloom v. Newark, 3 Ohio N. P. (N. S.) 480. Barthold v. Philadelphia, 154 Pa. 109. Weber v. Harrisburg, 216 Pa. 117. Denver v. Spencer, 34 Colo. 270. Silverman v. New York, 114 N. Y. Sup. 59. Mahon v. New York, 10 N. Y. Misc. 664. Ehrgott v. New York, 96 N. Y. 264. Burridge v. Detroit, 117 Mich. 557. Ankenbrand v. Phila., 52 Pa. Sup. Ct. 581.

. . . The maintenance of a public park does not imply, and should not include, the provision of man-eating specimens of zoölogy to dine upon the children of those who visit such park."

In Harper v. Topeka, 92 Kan. 11, a boy broke through the ice while skating on a pond in a park. The city stationed no watchman there to prevent. It was not held liable for the drowning.

A serious question arises as to how much of a duty of care government owes adults and children when it invites them to use parks or other recreational facilities. Where, as in the Lawrence case, a number of people are drowned thru the negligence of the city's servants, one wonders how far a legal principle can be carried without a more reasonable consideration of the facts.

In Gartland v. New York Zoölogical Society, 135 N. Y. App. Div., 163, the Court said: "There is no governmental duty put upon the municipality to provide parks and pleasure grounds, and collections of wild animals or fish, or paintings, or books, except in the large sense that a great city may with propriety consider the esthetic and not be confined to the practical."

There have been a number of other cases of children drowned in parks. In Barthold v. Philadelphia, 154 Pa. 109, a child sitting on a stone on the edge of a pond in Fairmount Park was drowned when the stone slid into the water. The Court held that a binding charge to the jury to find for the city was properly refused. In Capp v. St. Louis, 251 Mo., 345, a case in which a child was drowned under much the same circumstances, it was held a jury question whether the city was negligent in not protecting or eliminating the pool. The Court felt that the city must keep its parks in a reasonably safe condition for the benefit of all persons using them.

In Schauf's Administrator v. Paducah, 106 Ky., 228, the city was held not liable in a case where a child fell into an unenclosed pond on the commons.

In Anadarko v. Swain, 42 Okl. 741, a boy of 8 was drowned in a settling basin connected with the water-works but inside a park. A high wire fence had been around the basin, but was taken down by workmen and not replaced. The boy was attracted to the basin by his curiosity and childish instinct. The Court said that the child was on the premises by express invitation, and held the basin an attractive nuisance, and the city liable.

"The maintenance of a public park in a populous city is not only an implied, but an express, invitation to the public to resort to it for amusement and recreation, and where children of tender years and immature minds are invited to play and amuse themselves, the parents have a right to rely on the city to exercise a reasonable or ordinary care to keep the park and water-works system safe for the benefit of those who come there by such express invitation. . . . The city owed to adults and children alike the duty of exercising ordinary care to avoid injuring them anywhere within the boundaries of the public park, and it cannot escape liability for the death of this child by drawing a distinction between the duties the city owed to the invitees at different points or portions of the park. The view we take of the case is that the city owed to this child and its parents the duty to exercise ordinary care to avoid injuring him, no matter on which portion of the park the child might resort to for play."

In Nashville v. Burns, 174 S. W. 1111, a city owning a park and playground was held not liable to a minor struck by a swing in the park, because it was engaged in preserving public health and not in any proprietary or ministerial duty.

In Canon City (Colo.) v. Cox, 133 Pacific 1040, an action for injuries to a child playing on a merry-go-round in the city park, there was held to be evidence to sustain a finding that the city was negligent in maintaining the appliance in a defective condition.

In Ackeret v. Minneapolis, 151 N. W. 976, it was decided that a city maintaining footpaths in its parks which were used as thorofares is liable for injuries resulting from the dangerous condition of walks caused by the negligence of the city's employes. This holding is contrary to the early Massachusetts case, Clark v. Waltham, 128 Mass. 567, in which, altho the town was getting revenue out of a building on a fenced-off portion of the common, it was not held liable for the bad condition of the paths. In another early Massachusetts case, Steele v. Boston, 128 Mass. 583, the city was not liable to one run down by a sled on a path especially prepared by the city for that purpose by turning water on it to freeze. Reasonable precautions to protect pedestrians had been taken, however, by building a bridge at an intersection.

Another interesting phase of this same question is that of the public park where

there are numerous concessions, affording various kinds of amusement and opportunities for spending money. In Bisbing v. Asbury Park, 78 Atlantic 196 (1910), the city was exempted from liability on the weak reasoning that the accident happened in that part of the park that was kept grass-covered, free from concessions and for general public use. This seems to make the right of the injured person to redress depend upon whether the profits go into private or public pockets. On the difficulty of deciding whether a given duty is governmental or corporate, the Kentucky court, in Louisville v. Prinz, 105 S. W. 948 (1907), says:

"This is because the line between powers exercised by the municipalities in their public capacity and for purposes pertaining to the preservation of the public health, safety and morals, and those exercised for the convenience, advantage and benefit of a city and its inhabitants, is often so narrow that the distinction between them cannot well be defined or supported by good reason."

After all, it seems that the whole theory of city and county exemption from liability for negligence of this kind rests on nothing better than public convenience. One cannot help feeling that the theory of sovereignty, knowing no responsibility nor reason, is still struggling to stay with us.

Public Benefactions of Private Citizens in Texas Cities

PUBLIC benefactions of important and lasting character should always be made widely known—not for the glorification of individuals, but because of the stimulating effect upon public spirit. The parks, educational institutions, hospitals, etc. Among the cities to which public parks have been given are Denison, Waco, Fort Worth, Beaumont, Wichita Falls, San Antonio and Houston.

HOUSTON RECEIVES RARE BENEFACTIONS

WILLIAM M RICE ENDOWMENT FOR RICE INSTITUTE NOW AGGREGATES ABOUT $11,000,000.

GREAT PUBLIC HOSPITAL

George H. Hermann Gives This and 500 Acres for Park—Many Other Small Parks Donated.

GIVES HOME CITY LIBRARY BUILDING

BENEFACTION OF MR. AND MRS. J. A. KEMP TO WICHITA FALLS COSTS $25,000.

OTHERS DONATE PARK

W. M. McGregor and R. E. Huff Deed City Two Blocks of Land—Park Source of Inspiration.

BUYS BLOCK IN HEART OF CITY FOR PARK USE

FORT WORTH PROFITS BY GENEROUS GIFT OF CAPTAIN S. B. BURNETT.

COST ABOUT $150,000

Property Will Not Be Donated as Bare Ground, but Will Be Improved by Expert Landscape Architect.

HEADINGS FROM THREE ISSUES OF THE DALLAS *NEWS*

Dallas *News*, always active in the field of public welfare, has recently published a series of ten articles describing the enduring monuments that have been erected by patriotic men and women of Texas. These memorials include public libraries, great

The Service which the *News* is performing in calling attention to the gifts is one worthy of being duplicated in other parts of the country. Three of the column heads used in these interesting articles are herewith reproduced.

Mutual Fire Protection Aid Proposed for Connecticut Municipalities

Standard Adapter Couplings Recommended

TOWNS and cities in Connecticut which have fire departments are to be called upon by the Connecticut State Council of Defense to put into effect thruout the entire state a plan for the interchange of fire apparatus in emergencies. The matter has been investigated by the Council's Committee on Industrial Survey, which recently reported to the Council that, on account of the efforts in the past few years of the Fire Chiefs' Association, there is mutual aid coöperation to a very considerable extent among the various towns and cities.

The committee recognized the desirability of a standard thread on hose and hydrant couplings thruout the state, but did not recommend at this time any effort to change the various threads now used. Instead, it recommended most strongly that every fire department in the state be equipped with a sufficient number of standard adapter couplings to permit of ready mutual aid.

The adapter proposed has been designed under the direction of John C. Moran, chief of the Hartford fire department, who was named by the Fire Chiefs' Association a committee of one to assist the council's committee in this matter. The committee also has had the benefit of the advice of Horace B. Clark, chairman of the Board of Fire Commissioners of Hartford.

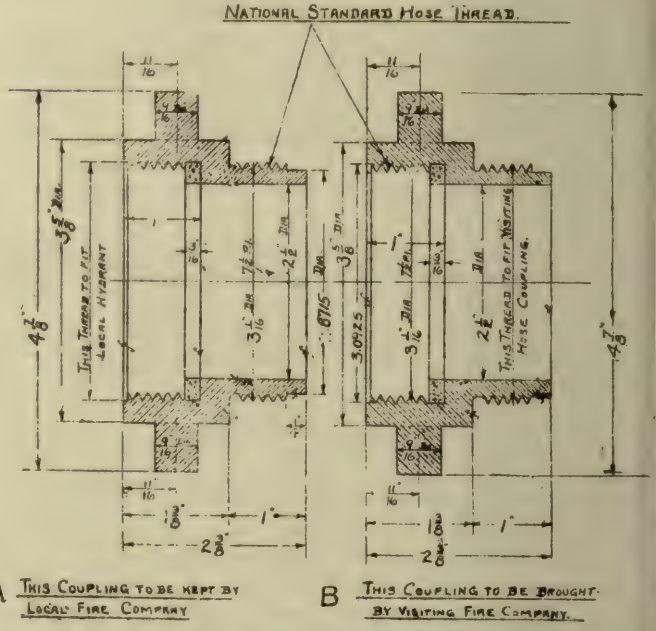
The State Council of Defense is making a determined effort to have every town in the state which has a fire department provide itself with these standard adapter couplings so as to make mutual aid possible at all times thruout Connecticut. The Council has arranged to secure these couplings at $5.75 each, and towns are to be given an opportunity to buy them from the Council at this rate.

The report of the Industrial Survey committee to the Council was in part as follows:

"The majority of towns have authorized their chiefs to use their own judgment in an emergency in asking and rendering aid. In a number of cases, however, delay may be caused thru the necessity of first obtaining the approval of the mayor or the board of fire commissioners.

"The obstacle of great variety of size and threads of hose couplings has been partially overcome in those towns where precautions have been taken, by the expedient of equipping the department with a sufficient variety of special couplings or adapters so that the hose of any city from which aid might be requested can be attached to the local hydrants.

"While recognizing the desirability of a standard thread thruout all towns in the state, your committee does not recommend at this time any effort to change the various threads now used by the different departments, but recommends most strongly that every department in the state be equipped with a suf-



ADAPTER FOR FIRE HOSE COUPLINGS TO PROVIDE UNIVERSAL FIRE SERVICE IN CONNECTICUT

ficient number of standard adapter couplings to permit of ready mutual aid.

"Detailed drawings of these couplings, designed under the direction of Chief J. C. Moran, which convert the odd thread of a local hydrant or hose to the national standard, are attached to this report.

"It is obvious that it is absolutely essential that this system to be successful must be used universally in the state (except where the thread is standard) in order that each department may be sure, regardless of where sent, to find hydrants equipped to receive hose couplings of standard thread.

"A quotation of $5.75 each has been obtained on orders in excess of 350 pieces.

"Your committee, therefore, makes the following recommendations, namely:

"That it be authorized in the name of the Council to instruct the various local agencies of the Council as follows:

"1. In cases where authority is not at present vested in the chief or acting chief to ask or render assistance in emergency, to obtain for him such authority.

"2. To arrange with the local departments in their districts, to place orders directly on the State Council of Defense for a suitable number of hydrant and hose couplings."

The committee has sent letters to all chairmen of the council's local agencies thruout the state urging them to take prompt action in this matter. The letters include order blanks on which the towns and cities may place orders for adapter couplings, and they also include a working drawing of the coupling.

The State Council of Defense feels confident that the adoption of the recommendation by towns thruout the state will provide an excellent basis for the interchange of fire apparatus on an elaborate scale in case of emergency.

Lightning Arresters a War Necessity

By T. Alfred Fleming
State Fire Marshal of Ohio

PURELY to safeguard foodstuffs, munitions, and the elements entering into a successful culmination of the World War, our Department, some time ago, issued an order requiring protectors in the form of lightning arresters and fuses on telephones.

After conferences with the telephone heads, it was found that supplies necessary for the changes contemplated could not be secured in the thirty-day time limit, and further consultations were held.

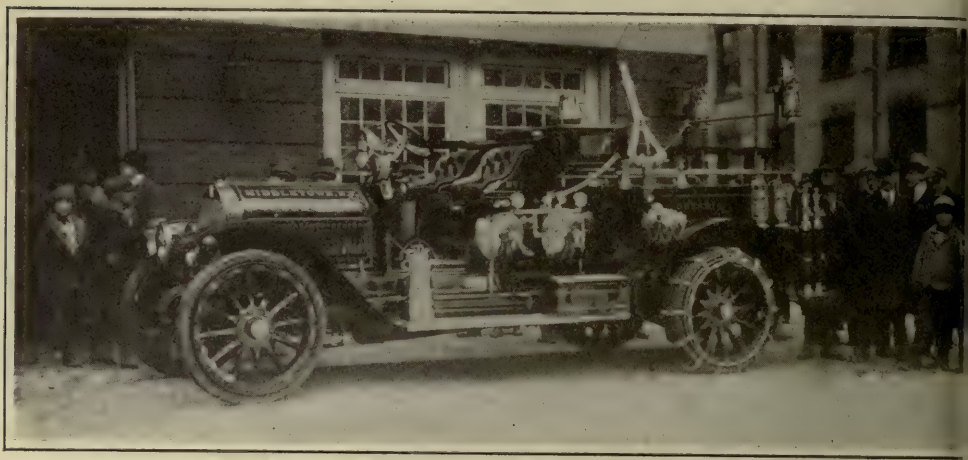
The heads of the Bell Telephone Company and the Independent Telephone organizations, patriotically coöperated with the Ohio State Fire Marshal's Department, and a satisfactory basis of agreement was reached, effective May 1, 1918, whereby protectors approved by the National Board of Fire Underwriters shall be installed at the subscribers' premises upon all lines serving establishments embraced by the following list:

Warehouses, flour and cereal mills and grain elevators
Wholesale provision and grocery companies
Cold storage plants
Canning factories, storage and preserving plants
Packing houses and abattoirs
Freight houses, depots and terminals
Wharf storage, both rivers and lake, including ship yards
Manufactories and storage of butter and cheese with an output of 100 pounds a day
Fertilizers and acid plants
Manufactories of shoes and leather goods
Foundries and machine shops making war supplies
Manufactories and storage of clothing and knitted goods
Lumber yard connections
Grain, hay and provision storage
Bakeries making 150 loaves a day or over, and food repositories

Exception is made of those lines which are unexposed in accordance with the following definition: an unexposed line is one which is entirely in underground cable or in metal-sheathed aerial cable from the central office to the building in which the instrument is located, or from the central office to the block in which such building is located, provided there is no liability of contact thru accidental means with wires which carry current in excess of 400 volts to ground.

The Ohio State Fire Marshal's Department is relieved now that the foodstuffs and the war materials are safeguarded from visitation of lightning, realizing that every dollar burned *now* is more than a dollar filched from the War Chest of the allies!

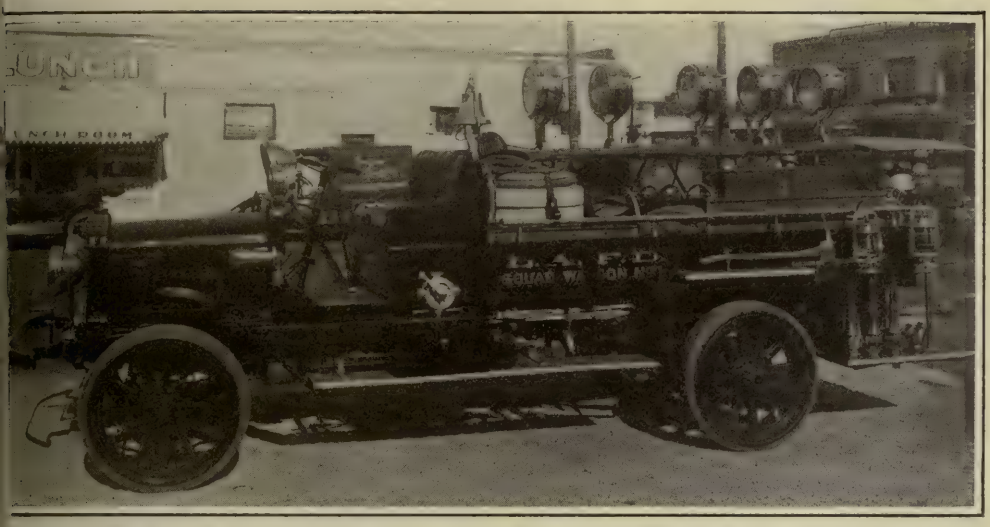
The Versatility and Endurance of Motor Truck



AMERICAN-LA FRANCE COMBINATION FIRE TRUCK, MIDDLETOWN, N. Y.

PACKARD 5-TON TRUCK, FULLY LOADED WITH SAND, AFTER CRASHING THRU A BRIDGE AT AKRON, OHIO

The truck was not damaged in any way. When the debris was cleared away sufficiently to allow th truck to be jacked up and lowered down to the bank of the stream, it started off under its own powe Within an hour it had been thoroly inspected, pronounced sound and unharmed, and was back on its jo for the Akron Cartage Company.



MORELAND MOTOR SQUAD WAGON USED BY THE FIRE DEPARTMENT OF LOS ANGELES, CAL., EQUIPPED WITH PORTABLE HEADLIGHTS, PULMOTOR, OXYACETYLENE BAR-CUTTING APPARATUS, ETC.

WHITE EMERGENCY TRUCK AS USED AT MINE RESCUE STATION

The oxygen helmets worn by the men enable them to penetrate far into the subterranean tunnels, thru passages laden with the most poisonous gas or smoke, and bring the unfortunate miners to the surface, where pulmotors, oxygen tanks and other means may be employed to revive them. The motor truck carries special equipment, such as fire extinguishers, safety lanterns, hose, axes, crowbars, miners' tools, drills, saws, picks, shovels, rope, compasses, complete sets of surgical dressings and instruments.

Modern Lighting Metho

THE OLD WAY

Two sets of poles.

Tubular steel for supporting trolley wires.

Cast iron standards for lighting.

DOUBLE EXPENSE

Unnecessary obstruction along the curb line.

Underground wiring absolutely necessary.

Difficulty of keeping both sets of poles in alignment.

THE ELRECO WAY

One set of Elreco combination

The addition of ornamental br and base transforms the ordinary trolley pole into a handsome lig standard.

"White Way" is obtained at less one-half the cost of a separate ins tion.

Lighting wires may be attach top of poles—saving all exp underground construction.

Curb line free from all unnec obstruction.

Get full details and catalog

Electric Railway Equipment C

Manufacturers **Cincinnati, Oh**

NEW YORK OFFICE **30 CHURCH STREET**

The "Take a Roomer" Campaign

By Lawrence Veiller
Secretary and Director, National Housing Association

THE campaign started by the Chamber of Commerce of the United States from patriotic motives and adopted by business men all over the country, urging citizens in their communities to open their homes to working men in order to accommodate the influx of labor that has come thru the development of war industries, is likely to have consequences not anticipated by those who started the movement, and fraught with great peril to the nation.

The "easiest way" is always the dangerous way.

It was a very natural thing for business men who have never had occasion to consider the social and sanitary problems of our great cities, when confronted with the problem of housing suddenly an increased number of workers in a given city, to say to themselves: "Why, the present buildings in this town aren't working with 100 per cent efficiency. There are lots of vacant rooms in every house in town that could be utilized to house a war worker and thus speed up the war."

The writer yields to no one in his desire to speed up the war, but questions seriously whether the "Take a Roomer" campaign was ever necessary and whether it has brought about the results that its proponents counted on.

It is all very well to say to the people in a community: "As a patriotic service, open your homes to these working men who are coming to this town to build ships or to make munitions and thus help win the war. Take in one man, take in two men, take in three men, take in six men; take in as many as your house will hold." And in the first flush of patriotic enthusiasm it is not difficult for many people to bring themselves to the belief that this is a desirable and necessary thing to do.

Unfortunately the persons who proposed this plan placed no restrictions upon it, and apparently never considered the conditions under which it might be very disadvantageous to take roomers into private homes. The greatest housing evil we have in America to-day is the problem of room overcrowding, which is inseparably bound up with the lodger or roomer problem. It has in the past been confined to certain alien groups in the population. It is a problem practically untouched to-day. I know of no city in the United States that has grappled with it effectively. Boston has expended much effort in seeking its solution; so has New York, but neither city has dealt with it satisfactorily.

Singularly enough, it is one form of housing evil which can be proved to have a direct causal relation to disease and bad health, and it has been so proved. Yet it is the only phase of housing that the country has not a program or plan for and has not done something effective toward overcoming. The sanitary, social and moral evils resulting from the introduction of strangers into family life in too close proximity, without privacy, without adequate ventilation, without sufficient air space, without proper bathing or toilet facilities, are so well known as to need no comment here.

Weighing my words carefully, I believe that the "Take a Roomer" campaign will bring about conditions that the country will not recover from in twenty-five years. I do not wish to be misunderstood. There are, of course, conditions where the taking of a single roomer, or even two or three roomers, into a family can do no harm whatsoever, but on the contrary is a good thing to do. It depends, however, on the kind of home, the number of free rooms there are available, their accessibility, their privacy—in a word, their suitability for the purpose.

In this "Take a Roomer" campaign, I regret to say there has been little or no consideration given by anybody to these fundamental conditions. The promoters of the idea have apparently given no thought to whether roomers were to be taken six in a room or eight in a room; whether they were displacing the rooms sorely needed by the growing children, the boys and girls of that family; whether the rooms were light or dark, whether the overcrowding result-

EFFICIENCY
OF
THE OTTERSON AUTO-EDUCTOR
PROVEN IN CHICAGO

THIS FLEET OF SIX AUTO-EDUCTORS IS CHICAGO'S RECOGNITION OF OUR CLAIMS OF EFFICIENCY, ECONOMY AND SANITATION

THESE SIX AUTO-EDUCTORS ARE ORDERED AS A RESULT OF THE ENORMOUS SAVING EFFECTED AND SANITARY WORK DONE BY ONE AUTO-EDUCTOR LAST YEAR.

THIS IS CONVINCING PROOF OF

EFFICIENCY

THE OTTERSON AUTO-EDUCTOR CO.

817 FAIRBANKS BLDG. SPRINGFIELD, OHIO

ing was likely to endanger the health of the people in that town as well as of the people in the house itself, and, finally, of the effect on the morals of the people thus living in such close quarters.

It was so difficult to make headway against the lodger evil in pre-war times that it seems especially unfortunate to have stimulated a tendency that had been already threatening the welfare of our institutions.

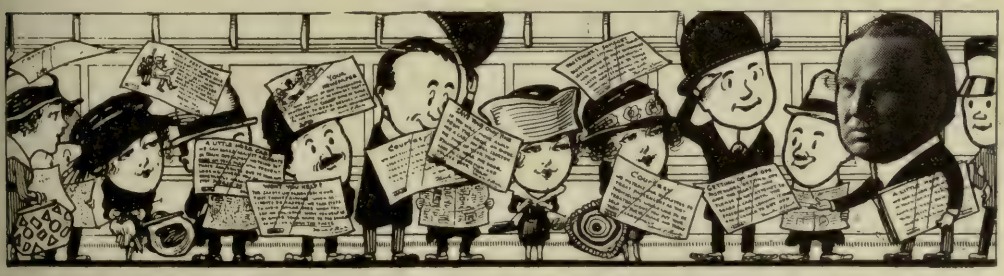
The reasons why it is difficult to make headway against the practice of taking in roomers are quite evident. In the first place the family or tenant occupying the house or the flat is generally in favor of it, for it means increasing their revenues in an easy way; the landlord is in favor of it, for he knows that with his tenants thus deriving increased revenues he can increase the rent, and he generally does; the roomer is in favor of it, for it furnishes him with more comfortable and cheaper accommodations than he can find elsewhere. The only persons against it are a few sanitarians and social workers, who realize only too keenly the sanitary and social evils that are bound to come from room overcrowding.

One reason why so little headway has been made in this field in the past has been the lack of recognition on the part of those combating the evil that there is no place in most cities in which the single worker can live in decent fashion. So long as this need is not met by the building of hotels for working men and working women, with individual bedrooms that can be rented at as low a rate as $3 a week, this evil is likely to flourish.

An interesting illustration of the reaction on a group of business men in a community which has probably exemplified more intensively than any other in America the problems and difficulties attendant upon the sudden growth of war industries, is found in the attitude toward this subject taken by the Chamber of Commerce of Bridgeport, Conn. In a recent statement, George Gove, Executive Secretary said:

"More than two years ago, acting on the basis of a patriotic appeal and possibly from self-interest in the face of increasing rents, homes that were never before open to strangers received roomers, and during a brief period all of the available rooming space in the city was occupied. As a result of that experience, I believe that I can say that representative public opinion in Bridgeport is vehemently opposed to any movement which will tend to restore the conditions thru which we passed two years ago. I believe that representative public opinion in Bridgeport is conscious of the evils which eventually arise from this form of congestion. An appeal to take in roomers carries with it no restriction as to the number to be taken in, and the isolation of the home, once broken, offers encouragement to profit to the fullest by the new policy. In Bridgeport, the number rapidly grew to considerable proportion, and for a time there were places in which six and seven were sleeping in one room.

"After two years of wrestling with this and every other municipal, social, and industrial problem which the war has brought, this community recognizes that expedients do not suffice; that problems must be understood in order to be solved, and that the solution must rest upon a solid foundation. Physical and social ills outside the factory and in the home are reflected in the factory in production."



GOOD ADVICE ON PUBLIC SAFETY AND COURTESY FROM THE PRESIDENT OF THE NEW YORK SUBWAY SYSTEM TO ITS PASSENGERS

The above cartoon from the New York *Evening Telegram* pictures the distribution of the posters which have been displayed in the subway cars, and which are of interest to any city which has a local transportation system. Some of the posters read as follows:

"*Getting On and Off.* Passengers getting off have the right of way. Please do not attempt to board a car until the passengers leaving it have had a chance to get off."

"*Courtesy.* We instruct our employes to treat passengers as they themselves would like to be treated. Won't you put yourself in their place, and treat them accordingly?"

"*Save Your Own Time.* If you will move away from the door on entering a car, you will shorten the time of your trip. Standing near the door adds to congestion and delays your train."

"*About Feet Again.* Hundreds of people have asked us again to request you not to sit with your legs crossed and your feet extended into the aisle. We are making some headway. Thank you!"

Tarvia

Preserves Roads
Prevents Dust

Tarvia in the famous Ogden Cañon, Utah

When a town is contemplating the use of Tarvia to preserve its roads and prevent dust, it is very apt to write to other towns where Tarvia has been thoroughly tried out. For instance, Rock Springs, Wyoming, secured the following report from the authorities at Ogden, Utah:

"I am pleased to state that Tarvia has proved a success in the City of Ogden. For the past three years we have been treating our gravel and macadam roads with Tarvia and in every case it has proved an entire success. I might say we are now constructing about two and one-half miles of Tarvia road on Harrison Avenue and the Dug-way, which is a part of the boulevard leading to our famous Ogden Cañon resorts.

(Signed) "CHRIS. FLYGARE,
"Supt. Streets and Public Improvements."

Tarvia has behind it ten years of experience and one of the strongest organizations of road engineers in America.

Now, when the nation needs good roads so that motor-trucks can help out the great railroad congestion, it is more important than ever that every community should investigate the road proposition thoroughly. Obviously, what we need is more good roads to save the situation.

To any one interested we should be glad not only to send our regular good-roads literature, but to give advice on specific road problems.

The Barrett Company

New York Chicago Philadelphia Boston
St. Louis Cleveland Cincinnati Pittsburgh
Detroit Kansas City Minneapolis Nashville
Birmingham Salt Lake City Seattle Peoria
THE BARRETT COMPANY, LIMITED: Montreal Toronto
Winnipeg Vancouver St. John, N. B Halifax, N. S. Sydney, N. S.

Photo Courtesy "American City," N

First Proportional Representation Election in Kalamazoo

By Harry H. Freeman
Secretary, Chamber of Commerce, Kalamazoo, Mich.

ON February 4, 1918, the electors of Kalamazoo adopted a new city charter of the manager type embodying the Hare system of proportional representation for electing the city commission of seven members. The first election under the new charter was set for Monday, April 1, 1918. Immediately upon adoption of the charter, candidates began to announce themselves, and on March 12—the last date upon which petitions could be filed—there were twenty-six candidates in the field. This number was later reduced to twenty-three by the withdrawal of three men. The list of candidates showed representation from practically every interest in the city.

The charter provides that any elector may become a candidate for the office of City Commissioner by filing, or having filed for him, a nominating petition containing the names of not less than fifty or more than seventy-five qualified electors. Six of the ten members of the then Board of Aldermen sought reëlection to the new commission. Business and labor both were well represented, and there were conservatives and radicals, men who had been identified with municipal ownership fights of the past, and men who had stood opposed to it. There were four candidates of Holland descent bidding for the support of the Holland element of the community, numbering about one-fourth of the voting population. It is safe to say that the electors have never before had such a variety from which to choose.

Unfortunately no big vital issue was raised during the campaign. It happened that soon after the nominations had been filed, Truxton Talbot, a representative of extreme radicalism, made up a ticket of seven, including himself. Thru his weekly paper "The People," he appealed to the laboring class to be self-conscious and to support his slate of seven men. About a week before the election a number of the "better element," frightened lest Mr. Talbot should get elected, organized a "Municipal Voters League." This league was an organization aimed to defeat what they called the Talbot political machine, and they recommended that the voters make their choices from among the sixteen candidates not on the Talbot ticket. The campaign of the Voters League resolved into a bitter fight on Truxton Talbot. His record was given to the people thru paid advertisements in the one daily paper of the city and thru circulars and handbills.

Kalamazoo has slightly over 9,000 registered voters. The first surprise was the very light vote cast, only 4,461 electors going to the polls. Considerable apprehension was felt during preëlection days over the voter's ability to intelligently mark his ballot under the new system, and yet only 157 ballots had to be declared invalid. The quota necessary to elect was 539. Two of the candidates, Connable and Upjohn, had more than their full quota on first choice ballots. No other candidates were elected by obtaining the quota until after the distribution of the two surpluses and the defeat and transfer of the ballots from fifteen other candidates. This showed three having obtained the quota of 539, with four other candidates remaining, who were declared elected in order to make the commission of seven. Another interesting feature was that all ballots but 214 were capable of being transferred up to the time the count ended. The Central Election Board met at the close of the polls at 8 p. m. The ballots were received by the Board at 10:45 p. m. and the final result was determined at 5:30 p. m. Tuesday.

As a whole the new commission is conceded thoroly representative and higher in ability and vision than the personnel of past aldermanic boards. Only one of the six former aldermen was elected, and his experience for the last nine years will provide an excellent connecting link between the old government and the new. Mr. Connable, who received the highest vote in the city, is a former mayor and a very popular business man. W. E. Upjohn is the father of the new charter movement

SHIPS, a hundred thousand ships should enter and leave our ports this year, to carry men, food and munitions for the Allies.

"There is now a Fisk Tire for every motor vehicle that rolls."

FROM the manufacturer to the trenches the motor truck is constantly playing its part in speeding overseas transportation. SHIPS depend on Trucks—Trucks depend on Tires. Never has quality meant so much!

BRUTALLY strong—built to withstand the greatest demands made upon them—FISK SOLID TIRES faithfully meet every possible requirement of truck service.

WHEN you need Solid Tires—buy Fisk.

FISK SOLID TIRES

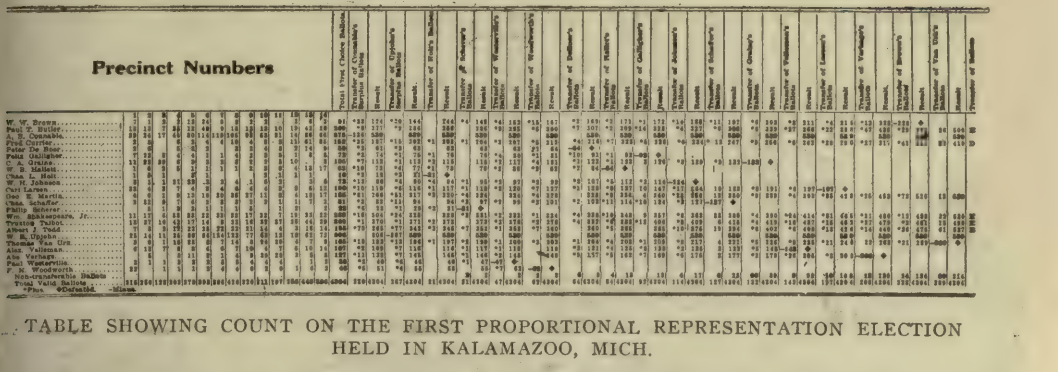


TABLE SHOWING COUNT ON THE FIRST PROPORTIONAL REPRESENTATION ELECTION HELD IN KALAMAZOO, MICH.

in Kalamazoo, and is one of the community's most progressive citizens. Two members of the new commission were members of the commission which framed the new charter—Upjohn and Shakespeare. If there is any disappointment, it was in the election of Truxton Talbot, and among those who appreciate the difficulty in modern municipal administrations, there is a feeling of satisfaction that Mr. Talbot is now a part of the city government, where he must defend and justify his actions instead of being critic on the outside free to tear down as he pleased. In summary, the membership of the city commission just elected includes men of ripe experience in civic affairs, men who know the weaknesses of the discarded system and the rich probabilities of development under the new order of things.

On the Calendar of Conventions

MAY 7-10.—HAMILTON, ONT.
Canadian Good Roads Association. Annual Canadian Good Roads Congress. Secretary, George A. McNamee, 909 New Birks Building, Montreal, Quebec.

MAY 13-17.—ST. LOUIS, MO.
American Water Works Association. Annual convention. Secretary, J. M. Diven, 47 State Street, Troy, N. Y.

MAY 14-22.—KANSAS CITY, MO.
National Probation Association. Annual conference. Secretary, Charles L. Chute, 58 North Pearl Street, Albany, N. Y.

MAY 15-22.—KANSAS CITY, MO.
National Conference of Social Work. General Secretary, William T. Cross, 315 Plymouth Court, Chicago, Ill.

MAY 20-22.—KNOXVILLE, TENN.
Southeastern Sanitary Association. Annual meeting. Secretary, Dr. Charles E. Smith, Greenville, S. C.

MAY 21-22.—ALLIANCE, NEB.
Nebraska State Association of Commercial Clubs. Annual meeting. Secretary, W. D. Fisher, Commercial Club, Alliance, Neb.

MAY 27-29.—ST. LOUIS, MO.
American City Planning Institute. Conference on City Planning. Secretary, Flavel Shurtleff, 19 Congress Street, Boston, Mass.

MAY 27-JUNE 1.—HAMILTON, ONT.
Canadian Public Health Association, to meet with the Ontario Health Officers' Association. General Secretary of the former, J. G. Fitzgerald, Toronto, Ont.

JUNE 4-6.—CHICAGO, ILL.
International Association of Fire Engineers. Annual convention. Secretary, Chief James McFall, Roanoke, Va.

JUNE 5.—CHARLOTTE, N. C.
North Carolina Commercial Secretaries' Association. Annual meeting. Secretary, C. W. Roberts, Henderson, N. C.

JUNE 5-7.—NEW YORK CITY.
National Municipal League. Annual meeting. Secretary, Clinton Rogers Woodruff, North American Building, Philadelphia, Pa.

JUNE 6-8.—BOSTON, MASS.
National Association for the Study and Prevention of Tuberculosis. Annual meeting. Assistant Secretary, Philip P. Jacobs, 105 East Twenty-second Street, New York.

JUNE 6-8.—CHARLOTTE, N. C.
Southern Commercial Secretaries' Association. Annual meeting. Secretary, B. F. Johnson, Wichita Falls, Tex.

JUNE 11-13.—NEWBURGH, N. Y.
Annual Conference of Mayors and Other City Officials of the State of New York. Secretary, William P. Capes, 25 Washington Avenue, Albany, N. Y.

JUNE 17-21.—KANSAS CITY, MO.
International Association of Rotary Clubs. Annual convention. Secretary, Chesley R. Perry, 910 South Michigan Avenue, Chicago, Ill.

JUNE 25-28.—ATLANTIC CITY, N. J.
American Society for Testing Materials. Annual meeting. Secretary, Professor Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.

JUNE 26-28.—CHICAGO, ILL.
American Association of Nurserymen. Annual convention. Secretary, Curtis Nye Smith, 19 Congress Street, Boston, Mass.

JUNE 26-28.—ATLANTIC CITY, N. J.
American Institute of Electrical Engineers. Annual convention. Secretary, F. L. Hutchinson, 33 West Thirty-ninth Street, New York City.

JUNE 27-29.—ATLANTIC CITY, N. J.
American Concrete Institute. Annual meeting. Secretary, Harold D. Hynds, 27 School Street, Boston, Mass.

JULY 1-6.—SARATOGA SPRINGS, N. Y.
American Library Association. Annual convention. Secretary, George B. Utley, 78 East Washington Street, Chicago, Ill.

JULY 1-8.—PITTSBURGH, PA.
National Education Association of the United States. Annual meeting. Secretary, J. W. Crabtree, 1400 Massachusetts Avenue, N. W., Washington, D. C.

GMC Trucks Municipal Money Savers

Efficient and economical trucking is an important factor in keeping down municipal expenditures.

In every branch of municipal service GMC Trucks have established a record for highest merit. From light ambulance work demanding speed, comfort and safety to the heaviest hauling or construction work where great strength and power are wanted, the GMC has demonstrated its complete dependability.

The principle of overstrong and oversize construction of vital parts of the GMC provides against unusual strain and gives extra power far beyond normal requirements whenever emergencies arise calling for additional effort. This adds much to the life of GMC Trucks and also makes for economy.

The uniform smooth working reliability of the GMC is recognized in a very practical way by its wide adoption for municipal work. This is why more GMC Trucks were recently ordered by the city of Chicago after receiving the highest rating on 16 competitive points.

Let Your Next Truck be a GMC.

GENERAL MOTORS TRUCK COMPANY

One of the Units of the General Motors Corporation

New York Philadelphia Boston PONTIAC, MICH. Chicago St. Louis San Francisco

Distributors Most Everywhere (345)

Why One Community Has Rejected the War Chest Idea

To the Editor of The American City:

Allow me to preface my further remarks by stating that I am a commercial organization secretary in a city of 11,000 population, and that, as is the case with the vast majority of my professional brethren, the great burden of campaigning details falls upon my shoulders. Allow me to say also that a War Chest would relieve me of a great deal of strain and worry. From a selfish point of view I favor the single-campaign idea—but, from the standpoint of the community, in whose destinies the Chamber of Commerce plays a great part, I must admit that I do not greatly enthuse over the once-for-all campaign. To explain:

There is the objection in the War Chest plan that, careful as we may be, we cannot anticipate accurately the future demands of existent war relief organizations, nor can we correctly estimate the number of such societies whose demands or requests may be justifiable. Who, for instance, can tell now exactly what the needs of the Red Cross, the Y. M. C. A., or the K. of C., or the many others, will be? Who can tell now but what some unanticipated war need may arise? After the Y. M. C. A. campaign we thought the social and recreational needs of our warring men were sufficiently and adequately provided for, and yet there followed the campaign for the K. of C. war funds and the War Camp Community Recreation Fund, with equally urgent and important appeals. Advocates of the War Chest will say, "The fund will provide for *all* war purposes." This leads to another objection.

People, no matter how patriotic or broad-minded they may be, like to know how their one-dollars, their five dollars, or their thousand dollars are to be used. There are those of us who would give proportionately more to the Y. M. C. A., or the K. of C., or to the Red Cross, than to other causes. There are many of us who would not care to have even a small portion of our contribution go for certain purposes. The objection may be narrow, but nevertheless it is a serious objection to the War Chest plan.

There is the danger that some organization may desire a share of the fund which, if granted, would antagonize certain elements in the community. The committee charged with the duty of disbursing funds cannot, no matter how careful or fair-minded they may be, interpret our desires or sentimentalities in the matter. Even tho we have a lawyer, a merchant, a manufacturer, a laborer, a Catholic, a Jew, and a Protestant, they cannot satisfy the vanity which you and I have in determining how much is our "bit" in matters of patriotism and sentiment.

Finally, there is the danger in the War Chest plan that, having had its big splurge, the community will drop back into a period of patriotic hibernation; the danger that, its one big effort over, the community will pigeon-hole its patriotism—its spirit—until the call comes again a year hence. This is, as I see it, the great danger and objection to the War Chest idea. At the same time it points out the value of repeated campaigns.

Frequent campaigns, as we see it in Salem, help to develop a spirit of coöperation not produced in one campaign. Such campaigns bring the workers (usually the same ones) in more frequent contact; we learn to know and understand each other, we learn to coöperate and work together for common ends.

Repeated campaigns also constantly bring to the attention of the people of the community the important fact (not yet sufficiently recognized) that we are at war, and that there are certain obligations which we at home owe to those that have gone. Thru the ever-present campaigns we are arousing patriotism; we are awakening in the community (in you and in me) a greater feeling of devotion for our country, our boys and humanity.

Let us take, for instance, my own community—Salem, Ohio. I am sure that we are far more patriotic, far more wide-awake, than we would have been had we raised a War Chest at the time of the first Red Cross campaign. I am sure that the community understands more thoroly what the war is about—what we are fighting

HIGHWAYS

The Only Sure Relief From The Transportation Menace

Garford MOTOR TRUCKS

HIGHWAYS mean motor trucks.

Look the facts squarely in the face.

The war is 85% industrial and 15% military.

Our industrial strength is greatly handicapped—put out of the running through the lack of adequate transportation facilities.

You can't blame the railroads. They have all and more than they can do to handle the tremendous volume of freight now on their tracks. Their rolling stock is tied up—their terminals congested.

The highway offers the only sure relief from the transportation menace that is threatening the very life of American industry—*the highway and motor trucks.*

You can do your Country a service and help your own business by utilizing motor trucks consistently for all short haul and inter-city deliveries.

Garford Motor Trucks are furnishing such service to hundreds of business men who pride themselves on being practical.

Why not you?

The Garford Motor Truck Company, Lima, Ohio

Manufacturers of Motor Trucks of 1, 1½, 2, 3½, 5 and 6 ton capacity
4½, 7 and 10 ton Tractors
The Garford Road Builder

or, what our obligations are. I know that here is a greater spirit of coöperation than here would have been had we had but one campaign—one grand splurge.

The War Chest idea may be more efficient; it may save time and effort; it may save some expense. And yet I cannot help but feel that in this efficiency there is something lacking. Allow me to call it "Efficiency—Minus."

Still, in our city we have attained a certain degree of efficiency, without the drawbacks accompanying the efficiency of the single campaign. At the time of the first Red Cross campaign, we called together a group of about one hundred and fifty of our livest wires, almost entirely from the membership of the Chamber of Commerce. An executive committee was appointed. Ten team captains were chosen. These captains in turn selected five men for each team. Definite territories were allotted each team. Our quota was $10,000. We raised over $17,000 in two days' campaigning.

For the Y. M. C. A. campaign, the same men were called together. The teams were enlarged to ten men each. Our quota was $10,000. We raised $12,450—twice as good as the country as a whole, despite the fact that we did not have the moral effect of a local Y. M. C. A. At the final luncheon it was unanimously voted to make the organization a permanent one, to take charge of all war relief work.

Since that time the organization has taken charge of practically all campaigns. It took active charge, for instance, of the Red Cross Christmas drive. With a quota of 2,100, we netted over 4,200 members—200 per cent efficiency. This same organization is taking charge of the W. S. S. campaign and has already considerably exceeded the city's quota. The Liberty Loan campaign is also under the management of the organization.

So it is that, despite the frequent campaigns (really now, they are getting easier all the time), Salem has not yet failed to go "over the top" to a considerable extent. We have learned the value of coöperation; we have aroused the patriotism of the "Quaker City"; we have awakened a somewhat conservative community to the realization that it has a very important work to play in this war. *We have built up a wonderful spirit of community coöperation which will remain a tremendous community asset after we have won this war.*

We may not have been entirely efficient from an effort- and time-saving standpoint; yet we are not blighted by the danger of "Efficiency—Minus."

ADRIAN R. MacFARLAND,
Secretary, The Salem Chamber of Commerce, Salem, Ohio.

Eliminate Cinder Subbase From Your Sidewalk Specifications

IN spite of its futility, cities still continue to specify a cinder subbase under concrete sidewalks. Cinders were originally included for the purpose of providing adequate drainage, thereby preventing heaving from frost. When frequent side drains to sewers were placed, they probably served some purpose. But now side drains are no longer required, and the subbase has really degenerated into a water basin into which water flows from all the surrounding soil.

If the natural soil drainage is good, there is no need for a cinder base; if the drainage is poor, a pocket is provided for collecting water. A subbase not only involves the cost of the cinders, cost of hauling, cost of handling and placing, but also the excavation of the soil for a depth of 9 to 12 inches and its subsequent disposal.

Concrete sidewalks have been in successful use in all climates and over all soil conditions, without any special provision for underdrainage.

Since it is a needless expense and consequently worse than worthless, the cinder subbase requirement should be eliminated from every sidewalk specification.

Federal Power Keeps the Roads Free from Snow

Flathead County, Montana, has such irregular train service that the problem of inter-city traffic during the winter months is a serious one.

Keeping the county roads free from snow with teams used to cost between $5.00 and $6.00 a mile.

Not only was this expensive but it was slow, tedious work.

Last winter the county commissioners put a sturdy 5 ton Federal behind a big plow and the roads were not only kept free from snow but the Federal proved far less expensive than the old method.

The brute power, rugged strength and stamina of Federal made this possible.

"Federal Traffic News" will bring to you each month many such instances of the adaptability of Federal Motor Trucks. Write for it.

FEDERAL MOTOR TRUCK COMPANY
345 Federal Street Detroit, Michigan

FEDERAL

A Capacity for Every Requirement

Another FEDERAL

This is the powerful 5 ton Federal which kept the roads of Flathead County, Montana free from snow during the past winter.

News and Ideas for Commercial and Civic Organizations

Organizing Industries for War Service

Baltimore's War Service Committees

BALTIMORE, MD.—The problem of how to keep the non-essential industries alive during the period of the war, and when "priority orders" are hampering enterprises not engaged on war contracts, is being solved in Baltimore by the Civic and Industrial Bureau of the Merchants and Manufacturers Association. An effort is being made by that bureau to organize all the industries manufacturing similar commodities into separate groups or units and to have each group placed under the direction of a War Service Committee of its own selection, vested with large powers to negotiate with the Government for war contracts.

The first step in the work of organizing the Baltimore industries was to send a questionnaire to the manufacturers, asking, among other things, for information with respect to the nationality of the officers of the company, the number of its employes, the nature of its products, and what other products besides its regular wares the plant is capable of manufacturing.

When the questionnaires are returned, they are classified and kept on file for ready reference by the Civic and Industrial Bureau, which receives numerous local and out-of-town inquiries for information in regard to where certain articles can be obtained, and is able to divert a great deal of business to the industries on its list. When the Bureau receives requisitions from Washington, every firm listed in the group in which the articles belong is notified at once. Such requisitions are received daily, and cover a wide and miscellaneous field.

The manufacturers who are engaged in analogous lines of work are urged to get into communication with each other and form themselves into these industrial groups. After the preliminary discussions among them have been concluded, the director of the Civic and Industrial Bureau is ready, upon call, to explain the method of organizing the groups so as to make them fit into the plans which are being adopted by the Washington authorities for speeding up production.

The Civic and Industrial Bureau also issued a pamphlet entitled "How Baltimore Manufacturers Can Do Business With the Government," containing "Suggestions and Information for the Manufacturers Whereby They Can Seek War Contracts With Such of the Various Washington Departments, Bureaus and Divisions as are Interested in Purchasing Supplies of All Kinds." The pamphlet also contains a list of the articles needed by the War Department, the Navy Department, the Quartermaster's Department, and the War Shipping Board, also the personnel of the Council of National Defense and of the Purchasing Commissions of the Allied Foreign Powers.

One of the chief objects of the movement, is to encourage factories not essential to the prosecution of the war to alter their normal operations somewhat so that they may be able to enter the field of war activities and secure contracts which will keep them running. In case a manufacturer is not able to produce any complete commodity required by the Government, he is advised to show the list of government requirements to an expert mechanical engineer, who usually knows the component parts of the listed commodities, and should be able to tell the manufacturer what parts, if any, his machinery is capable of producing. He should also be able to tell whether the machinery in general can make other than the normal products.

In cases where manufacturers already

$5000.00

for the best examples of Truck Operating Efficiency

Attention is called to the following announcement recently made by the Council of National Defense:

"The Council of National Defense has given its formal approval to all measures designed to facilitate the use of the motor truck in transportation wherever it can be utilized. It is urging all communities as far as possible to adapt the motor truck to their local needs and encourage its use in any way to help existing transportation problems."

To promote maximum results in motor transportation, the Packard Motor Car Company offers a total of $5,000 in awards to owners and drivers for greatest efficiency in hauling. The awards will be based on certified records of Packard truck operation over a period of three months, beginning June 1. Best results are obtained through full loads, careful routing and proper maintenance of the trucks. To win the awards records must be kept in accordance with the National Standard Truck Cost System. Full particulars will be furnished by us or any Packard dealer. Every Packard truck owner and driver is invited to compete for the awards.

EFFICIENT HAULING is now a patriotic duty. It will release railway cars for government use.

Ask the man who owns one

PACKARD MOTOR CAR COMPANY, *Detroit, Mich.*

belong to a national organization of their own industry, the local War Service Committees will of course act directly thru the National War Service Committees. The Chamber of Commerce of the United States is developing a series of War Service Committees composed of a limited number of leaders from each of the many nationalized industrial groups. These national industrial groups are being so organized that the Government can get into touch at once with their leaders. The plan greatly facilitates the placing of orders, makes for their equitable distribution over a wide area and for speed in the completion and delivery of the goods.

The consummation of this grouping plan is not a matter of mere sentiment; it is a definite, practical, business-getting undertaking. Those who are now indifferent to it will no doubt find in the end that they have been very much the losers and will censure themselves for their lack of business sagacity and enterprise. These are days when organized efforts only are effective in producing results; the very best of individual efforts cannot be so successful.

To summarize, thru the group organization such questions as the following can be taken up:

1. The distribution at reasonable prices of orders from the Government which the Government *is not able to place satisfactorily with individuals.*
2. The providing of additional sources of supply when it is beyond the power of the whole industry to care for the demand, thru
   (a) The speeding up of present facilities.
   (b) The coöperation of related productive capacity.
   (c) The shifting of production to industries not otherwise essential to winning the war.
   (d) The providing of additional facilities.
3. The securing of proper priority for the shipment of supplies to or finished products from various industries represented.
4. Matters affecting the supply or productivity of labor.

Walter S. Gifford, Director of the Council of National Defense, expressed himself thus in regard to the need of organizing the industries:

"We feel that the establishment of representative committees formed in such manner as to entitle them to speak for their entire industries will render immediately available valuable sources of information upon which the Government may draw in connection with the business and industrial problems attendant upon the conduct of the war. *It is most desirable that representative committees of the industries be formed by the industries themselves at the earliest moment.*"

A. S. GOLDSBOROUGH,
Director, Civic and Industrial Bureau, Merchants and Manufacturers Association of Baltimore.

Editorial Note.—War Bulletins Nos. 24, 33 and 34, issued by the Chamber of Commerce of the United States, contain valuable information on the subject of organizing industries for war service, as do also their pamphlets entitled "War Service Committees, Plan of Organization, Their Scope and Duties," and "War Service Committees of the Nation's Industries as an Aid to the War Program."

Cleveland's War Industries Commission

Cleveland, Ohio.—A city transformed into a vast workshop of many departments, each a complete unit, manufacturing everything from clothing to tanks, each unit geared to the highest point in speed, quality and quantity of product and each department so classified that the Government can put its hands, in the shortest time, upon the organization and machinery necessary to make war materials—this is Cleveland under the mobilization of industry planned and perfected by the War Industries Commission of the Cleveland Chamber of Commerce.

It's the "Cleveland plan"—the Cleveland plan of preparedness, the city's answer to the Government's request that the country mobilize its industries for speed and quantity in production of needed war materials.

Compliments for the "Cleveland plan" have been many, but one of the most flattering is that of Henry L. Doherty, banker and operator of public utilities corporations, who, in a recent public address, declared that the Cleveland War Industries Commission's plan for coöperation with the Government is so complete and so thoro that he would "strive for a similar organization in every one of the two hundred cities in which we operate public utilities."

Just what is this "Cleveland plan"; how did it originate and how was it advanced to its present state of perfection? It was just before Christmas, 1917, that Charles A. Otis, then President of the Chamber of Commerce, and Christian Girl, President of the Standard Parts Company and now head of the Liberty Motor Truck Division, were called to Washington to confer with the War Department officials regarding increasing, in Cleveland, the production of munitions and other war accessories re-

Whole Hearted Service

A tire is for you or it is against you. There are no halfway measures nowadays when fire-fighting has a world-wide importance. Firestone careful building methods and high-grade materials give you dependable service; service which is for you in every way.

We show here a tire for high-speed apparatus, the Firestone Cushion Tire. It has the extra resiliency and the sure hold that makes speed safe for mechanism and men. Also the long life which goes with all Firestone equipment.

For every type of apparatus there is a Firestone tire especially built for its specific field. Our experts are at your disposal with advice as to the equipment best fitted to give you efficient, economical results. Call in the Firestone man.

FIRESTONE TIRE AND RUBBER COMPANY
FIRESTONE PARK, AKRON, OHIO
Branches and Dealers Everywhere

Firestone

quired by the Government. As a result of this meeting, the Cleveland War Industries Commission was organized as one of the Chamber of Commerce activities. J. H. Foster, President of the Hydraulic Pressed Steel Company, was appointed chairman of the Commission, and, within a few weeks after the commission idea was first suggested, the Commission had opened an office in Washington to enable it to keep in close touch with the requirements of the Government and with the Cleveland plants that are, or may be, equipped to manufacture those things the Government requires.

Those in charge of the Washington bureau, thru the head office in Cleveland, know what every Cleveland plant has in the way of equipment, skilled and unskilled labor, and what, in the way of material can, or could, be turned out in each. Even the smallest shops have been listed, and they, in the aggregate, can contribute immeasurably toward the production of war material.

Altho primarily a Chamber of Commerce activity, the War Industries Commission does not confine its service to members of the Chamber of Commerce. It is for all of Cleveland—an organization whose only object is the most complete coöperation with the Federal Government.

It is no primary part of the War Industries Commission to obtain contracts for Cleveland manufacturers. Its mission is to keep the Government constantly informed as to what it can depend upon from Cleveland in the way of supplies. One of the objects of this bureau has been to secure such coordination among the various industries that the Government may buy sixteen different parts of a certain machine or equipment from as many different manufacturers in the Cleveland district if it wishes. Were coördination not possible thru the War Industries Commission, those parts might be shipped with great waste of time and car space to some far-away point for assembling. The War Industries Commission is supplied with information in regard to the Cleveland factories which enables it to show the government authorities the saving in time and transportation that will result from having the various parts assembled in the Cleveland district and the machine shipped as a whole.

The War Industries Commission was organized with an executive committee, of which J. H. Foster is chairman. W. E. Tousley, Secretary of the Cleveland Industrial Development Company, is the Secretary. Mr. Otis, of Otis & Company, investment bankers, is on the executive board.

The first step of the Commission after it was organized was to divide Cleveland industry along functional lines. Manufacturers thoroly familiar with the work of the divisions were appointed chairmen of the following committees:

Castings
Forgings and Stampings
Engineering
Automotive
Chemicals, Oils, Paints
Machinery and Machine Products
Textiles and Clothing
Wood and Leather
Food Production
Banking and Finance

In order to do the work thoroly and introduce the personal touch necessary in an organization which is to determine the production and capacity of each plant, appropriate subdivisions of each division have been made, with a chairman in charge of each. Each subdivision chairman has a committee of sufficient size to enable the apportionment of plants, so that each committeeman will have under his direct charge only such a number of plants as he can keep in close personal touch with and report upon. In this way, thru its chairmen, subchairmen and committeemen, the Cleveland War Industries Commission can promptly reach down into any branch of industry and determine what the condition is and what capacity is available for government production.

Thru the efforts of the War Industries Commission, representatives of the Inspection Division and the Finance Division of the Ordnance Department were secured for Cleveland, and the Commission also was instrumental in having Samuel Scovil appointed as Chief of the Production Division of the Ordnance Department for the Cleveland district. Mr. Scovil resigned the presidency of the Cleveland Electric Illuminating Company, Cleveland's largest public utility, to accept this appointment.

It was also on the recommendation of the Cleveland Commission that the country has been divided into ten districts by the Ordnance Department, better to handle the

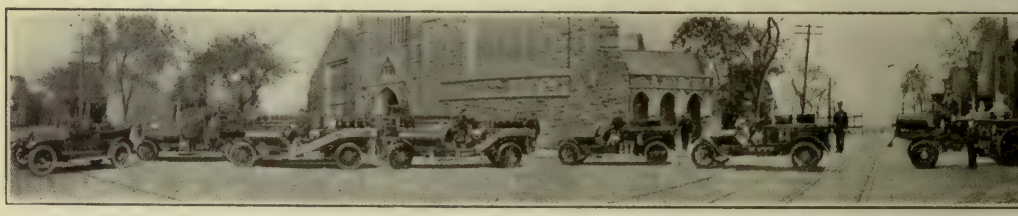
VICTORY DEMANDS EFFICIENCY FROM OUR NATION

EFFICIENCY demands UNCEASING PRODUCTION of munitions and supplies.

UNCEASING PRODUCTION demands, first of all, adequate protection against the mysterious, and seemingly methodical, fires that are threatening our plants from coast to coast.

ADEQUATE PROTECTION demands **FIRE DEPARTMENT EFFICIENCY** which depends largely upon the **RELIABILITY** and **QUALITY** of its **FIRE FIGHTING APPARATUS.**

"THE BEST IS NONE TOO GOOD"



Cohoes, N. Y., Fire Department Completely Equipped with American-La France Motor Fire Apparatus

AMERICAN-LAFRANCE FIRE ENGINE COMPANY, INC.

Elmira, New York, U. S. A.

Member of the National Automobile Chamber of Commerce. Licensed under the Dyer Patents

Branch Sales Offices and Service Stations

New York Boston Chicago San Francisco Portland, Ore. Dallas
Los Angeles Atlanta Denver Pittsburgh Baltimore Minneapolis

CANADIAN FACTORY, TORONTO, ONT.

production and shipping problems incident to a speeded-up war program. To this Commission also has been given the task of organizing the industries in two-thirds of the State of Ohio and in three counties in Pennsylvania, and the entire industrial strength of this district has been mobilized for government service.

This, then, is the "Cleveland plan." Summed up, it is the turning over for the service of the Government of the industrial brains of the city, the physical plants of a great industrial center, and the workmen, from specialist to laborer, all with the one object of helping to win the war. That the idea has proved itself "the big industrial idea" is shown by the results obtained and by the desire of other centers to adopt Cleveland's plan for coöperation between industry and the Government.

E. A. SMILEY,
Cleveland Chamber of Commerce.

Williamsport Manufacturers Represented in Washington

WILLIAMSPORT, PA.—A bureau of Associated Manufacturers was created last January by the Williamsport Board of Trade for the purpose of securing government orders for the factories located in the Williamsport district. The Board of Trade believes that the war will last for some time, and recognizes the fact that unless the manufacturers are engaged in making articles needed for the war, they will find it extremely difficult to obtain a sufficient quantity of fuel and raw materials to keep their factories running. In order that labor may be continuously employed and the factories be permitted to operate, therefore, the manufacturers are being urged to exert every effort in their power to secure a fair share of this business.

The Williamsport Board of Trade sent its president, Charles C. Krouse, to Washington to represent the Associated Manufacturers, and to open up an office equipped to solicit war orders. The office is located in the Woodward Building, and Mr. Krouse has built up an organization sufficiently large to take care of the work of soliciting orders daily from the buyers for all the principal departments of the War Department. The effect of this work is already evident, and it is believed that before long the majority of the factories in the Williamsport district will be employed upon government work.

The operating expenses of the office, such as rent and the salaries of the employes, are being assessed against all the manufacturers who are members of the bureau on a pro rata basis, dependent upon the amount at which the business of each is capitalized. A sufficient number of assessments have been made to guarantee the expenses of the bureau to September 1, 1918. In addition to this assessment, a commission of two per cent of the amount of the contract is charged to the manufacturer on orders secured for him. As soon as the orders begin to come in in large enough quantity, this commission charge will probably be ample to maintain the bureau without the assessment charge, and it is hoped that it will be possible to rebate to the members of the bureau the assessments which they have paid.

WILLIAM S. MILLENER,
Secretary-Manager, Williamsport Board of Trade.

Cincinnati's Survey of the Garment-Making Industries

CINCINNATI, OHIO.—The Survey Committee of the Cincinnati Chamber of Commerce has recently completed a vocational survey of the garment-making industries in Cincinnati which may be the means of revolutionizing the industry. The trade of garment-making is traditionally a woman's occupation, which has increased in importance, and the survey is a definite effort looking towards the progress and welfare of the women employed in it.

The report of the survey is the work of Miss Cleo Murtland, the Secretary in charge of Women's Work of the National Society for the Promotion of Industrial Education, in collaboration with Frank P. Goodwin, Director of Civic and Vocational Service in the public schools, and C. R. Hebble, then Manager of the Civic and Industrial Department of the Cincinnati Chamber of Commerce, now the Executive Secretary of the Chamber.

The purposes of the survey are summarized in the report as follows:

1. To determine the extent of the need for trained workers in the garment trades in Cincinnati.
2. To determine the extent to which instruction in the garment trades may be given in the schools.

SAVES HALF

The Cost of Moving Dirt

Think of it! A compact, easy-running machine that will scrape and load dirt or gravel without any plowing or other preparation—haul and dump it in piles or spread as desired anywhere. That loads 1½ yards of dirt in 30 seconds. Half your labor cost saved on any dirt moving job. Doubles profits for contractors and dirt movers—pays for itself on first big contract.

SPAULDING 2-IN-1 ROAD MACHINE

Handles Dirt and Gravel by Horse or Tractor Power

Only one man and four horses are required to operate a Spaulding Machine. Remember it does all the work. No job of excavating or grading can "stump" it—hard earth or soft clay or gravel—it's all the same.

Road Builders—Contractors—County Supervisors—all who have grading and dirt moving to do—you can't afford to ignore the possibilities of a machine that will double the work of your crew—or do same amount of work with half your crew.

Write today for circular and full information.

We Want Jobbers and Dealers

If you are in a position to represent us in your territory—let us tell you about our attractive agency proposition—a chance for easy profits — because the Spaulding sells on sight.

Loads 1½ Yards Dirt in Thirty Seconds

Spaulding Mfg. Co.
Dept. 240
GRINNELL, IOWA

FABRIC FIRE HOSE

is of an unusually careful manufacture WAX and PARA GUM TREATED

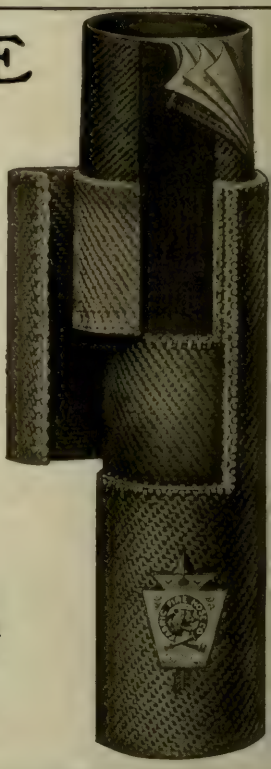
The lining is of fine Para Gum, hand made, four calendered, smooth bore or lap-jointed

Circular balance woven, each strand of cotton is treated to a bath of melted Wax and Para Gum, then cabled and woven into the jackets.

Absolutely waterproof, making the ideal hose for fire departments.

Treatment lubricates and solidifies the strands of cotton, assuring long wear.

Made in all sizes from 1 to 6 inches inside diameter.



FABRIC FIRE HOSE CO.

COR. DUANE & CHURCH STS., NEW YORK

Branch Offices

CHICAGO	OKLAHOMA CITY	ELMIRA, N. Y.	MONTREAL
ATLANTA	PORTLAND, ORE.	BINGHAMTON, N. Y.	PROVIDENCE
COLUMBUS, O.	SAN FRANCISCO	PITTSBURGH	DALLAS, TEX.
MINNEAPOLIS	BALTIMORE, MD.	NEWARK, N. J.	

Patentee and Sole Manufacturer

(a) As trade preparatory courses for young persons who expect to go to work.
(b) As day trade-extension and part-time courses for persons employed in the factories who wish to advance in the trade.
(c) As night trade-extension courses for trade workers.

3. To determine what elements of the trade may be taught in the schools.
4. To determine what educational qualifications are desirable for successful work in the industry.
5. To secure the coöperation of the public schools and the manufacturers and employes engaged in the garment industries of Cincinnati in establishing and conducting vocational courses for girls that will extend their general education and give a form of experience that will fit them for desirable wage-earning occupations in the industry.

The study disclosed the fact that not over twenty-five per cent of the workers engaged in the garment industries (exclusive of cutters, for whom apprenticeship training is provided) are sufficiently trained for their work; this means that some form of training must be provided, not only for those who wish to enter the industry, but for those already engaged in it whose training has not been adequate and whose promotion is slow, as a consequence. Both the employers and the employes agree that vocational courses should include training for garment-making, and that emphasis should be placed upon (1) making the entire garment, exclusive of the cutting and pressing, which are distinct from the making processes, and (2) specialization to develop normal speed and accuracy of work in one or more phases—operations, so-called—of factory garment-making.

The present method of instruction used for teaching sewing in the regular schools is not meeting the need, and the factory makes only incidental preparation for training new workers. One of the principal reasons for making the study of the industry was to determine what methods may be drawn from the modern, commercial type of sewing and garment-making to replace in the schools those that are rapidly becoming obsolete for manufacturing and commercial purposes.

The report goes into the details of the subject very thoroly under the following chapter headings: Summary and Constructive Recommendations; Purpose and Method of the Study; The Garment-Making Industries vs. The Needle Trades; Some Historical Facts About the Garment Industries of Cincinnati; Present Organization of the Cincinnati Garment Industries; Conditions in the Garment Industries; Selection and Promotion of Workers in the Garment Industries; Some Facts Regarding the Public Schools; Descriptive Analysis of the Garment Industries; What the School May Teach the Garment Workers.

It is hoped that the report may be useful not only to Cincinnatians, but to those in other cities who are interested in solving the problems of vocational instruction for girls in the public schools, and to garment manufacturers who wish to learn in what manner the schools may help them and their employes. The Cincinnati schools had begun to adopt the recommendations of the report before it was published. Copies are available for distribution where they will be of real service.

C. R. HEBBLE,
Executive Secretary, Cincinnati Chamber of Commerce, and Director of the Survey.

Recently Issued Printed Matter

Alliance, Neb.—"Community Dividends," the fourth annual report of the Alliance Community Club.

Colorado Springs, Col.—The Colorado Springs Chamber of Commerce *Official Bulletin*, containing a list of "Some Accomplishments of 1917."

East Liverpool, Ohio.—A pamphlet entitled "Activities and Accomplishments of the Chamber of Commerce of East Liverpool, Ohio," for the year ending January 31, 1918.

Holyoke, Mass.—The Year Book for 1916-1917 of the Holyoke Chamber of Commerce, "a report of two years' constructive undertaking and achievement."

New Castle, Pa.—A booklet entitled "Invoice of Things Done and Things Contemplated," issued by the Board of Trade of New Castle, Pa.

Poughkeepsie, N. Y.—A booklet entitled "Summary of Undertakings and Accomplishments of the Poughkeepsie Chamber of Commerce," being the first annual report issued since the Chamber was reorganized in March, 1917.

Schenectady, N. Y.—The Annual Report for 1917 of the Schenectady Board of Trade.

Tyrone, Pa.—A folder entitled "Tyrone's Chamber of Commerce Records the Work of Last Year."

Williamsport, Pa.—A booklet entitled "Own Your Own Home in Sawyer Park," issued by the Williamsport Improvement Company, a company organized nearly a year ago by the local Board of Trade for the purpose of providing manufacturing sites and workmen's homes for new industries in Williamsport.

Republic Fire Hose Earns Good Opinions

The comment about Republic Fire Hose is always favorable comment.

It has earned this good opinion by the excellent service it has rendered.

Thousands of users have proven to their own satisfaction that Republic Fire Hose is a better fire hose.

The cotton jackets are woven by our own experts from the best yarns obtainable.

The rubber linings are compounded from formulas that are the result of years of experience in building fire hose.

Republic Fire Engine Suction Hose is light and flexible and will withstand the most severe pumping strain

The Republic Rubber Corporation

Youngstown, Ohio

Branches in all principal cities

Commercial Bodies Can Help the U. S. Employment Service

By John B. Densmore
Director General, U. S. Employment Service

AT its war convention at Atlantic City last September, the Chamber of Commerce of the United States unanimously adopted resolutions urging that the United States Employment Service be made a separate arm of the Department of Labor and reorganized and extended to serve as the national machinery for the mobilization and distribution of the labor of the country for war production. This was done last January when the administration of a national war labor program was placed in the hands of the Secretary of Labor, and the reorganized Employment Service now asks the aid of the Chamber of Commerce of the United States and its thousand constituent business organizations in its war emergency work.

All chambers of commerce and boards of trade, particularly those in communities which have no public employment offices, are asked to establish emergency farm labor agencies as branches of the United States Employment Service. The farm-labor problem must be handled locally as far as possible, and no organization is better able to recruit a community's available agricultural workers and place them with the farmers of the surrounding country than its commercial body. In addition to bringing regular farm labor and farmers together, it is best situated to recruit men who are willing to give from several days a week to several months in harvest and other work. Those in industrial centers can perform especial service by returning to the farms men of farm experience who of late have been employed in war industries and are ready to return to agriculture. Commerce chambers also are best able to obtain the coöperation of manufacturers in their memberships for releasing employes for farm work during the height of the harvest season.

Establishment of Return-Loads Bureaus Advocated

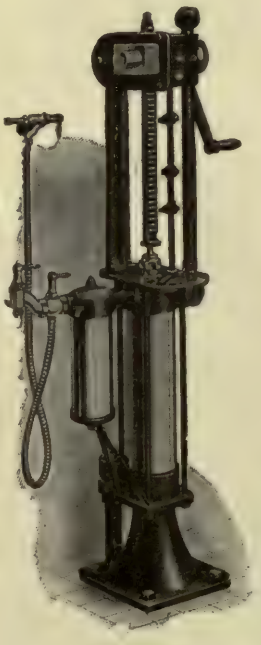
THE following resolution has been passed by the Council of National Defense:

"The Council of National Defense approves the widest possible use of the motor truck as a transportation agency, and requests the State Councils of Defense and other state authorities to take all necessary steps to facilitate such means of transportation, removing any regulations that tend to restrict and discourage such use."

With the coöperation of state and local bodies, thru its Highways Transport Committee and its State Councils Section, the Council of National Defense is building up a system for more efficient utilization of the highways of the country as a means of affording merchants and manufacturers relief from railroad embargoes and delays due to freight congestion. The purpose is to take some of the burden of the short haul off the railroads and put it on motor trucks operating over the highways.

The logical agency for bringing the shipper and the truck owner together is the local business men's organization. The method is the establishment of a Return-Loads Bureau—an information department that acts as a clearing house for this particular purpose. Once initiated, the work of such a bureau can, in most cities, be carried on by a single employe of the chamber, probably in addition to his other duties. Bulletin No. 1 (April 2, 1918) of the Highways Transport Committee of the Council of National Defense, Washington, D. C., explains clearly this method of saving waste in transportation. Thru the Connecticut State Council of Defense, with the coöperation of the local chambers of commerce, Return-Loads Bureaus have been established in fifteen cities. Such a bureau has also been inaugurated under the auspices of the Merchants' Association of New York City. It is desirable that the State Council of Defense, where one exists, should endorse the movement, but it is not necessary that the chamber of commerce in any city should wait for it to do so. Any chamber can initiate the work and then propose to similar chambers in neighboring cities to do likewise and establish an exchange of information.

The Better Way



Cut No. 41

1 GALLON GASOLINE PUMP FOR INDOOR USE

Countless tests of the most severe character have proven Bowser Gasoline Storage Systems to be the "Better Way" to store and handle this volatile and inflammable liquid.

Gasoline is stored as safely as water. Fire cannot get to it—and in case of fire there is no danger—the Bowser is Fire-Proof.

BOWSER ESTABLISHED 1885

Oil *and* Gasoline Storage Systems

are built for any capacity or requirement. Measure accurately, prevent evaporation and deterioration. Are built of selected materials by expert workmen.

Write for interesting Fire Booklet

S. F. Bowser & Co., Inc. Fort Wayne, Ind., U. S. A.

Sales Offices In All Centers — Representatives Everywhere

Industrial Surveys for War-Time City Planning

By A. Pearson Hoover
Of Goodrich, Hoover & Bennett, Consulting Engineers

IF there is one word which the present war has brought out clearly in every one's mind, that word is "efficiency"—efficiency in operation, efficiency in production, efficiency in management, efficiency in all the forces of the community, and efficiency in all the resources of the country. Efficiency has for its objective increased production, increased wages, increased revenues, and consistent, healthy development. And in war times efficiency is not afraid to be a pioneer. "Let someone else try it out and let us know the results" has been considered by a great many as the essence of wisdom in governmental and business methods. The war has been a grim but very proficient educator to that class of individuals.

In not a few municipalities the idea still prevails that a city should develop and grow with the whims of the speculator; and there is resentment to any inference that a comprehensive plan, viewing all problems and conditions in the proper relation, studying and analyzing methods for betterment, can accomplish any practical result. When perhaps the progress of other industrial centers becomes marked in comparison, steps are sometimes taken to ascertain the causes that have brought such lack of development in relatively the same ratio. This investigation generally proceeds upon the theory that the trouble is from an outside source. Almost any exterior condition will be used to the utmost as a reason for the lack of development, while, in the majority of cases, the chief faults are within the boundaries of the municipality itself.

From war experience there can be drawn example after example of the need of industrial city planning,—the need of studying and analyzing commercial forces, the transportation facilities and labor problems to meet war-time conditions and to provide for the growth of the community after the war.

Look at the transportation facilities in most of the industrial centers and you will find that they "just grew" without any definite plan. Switching charges can be reduced by eliminating unnecessary and parallel trackage and wasteful switching movements. A box car and engine produce revenue when moving, not when standing still. Services can be improved by a systematic schedule; revenues to the carriers can be increased by the reduction of the overhead charges; and benefits will accrue to the community from the elimination of certain "blighted sections" caused by unnecessary misplaced trackage and yards which can be supplanted by intensified industrial development.

Often certain sections are advantageously located, all conditions being considered, for the development of a certain line of manufacturing; certain other sections are best adapted for residential areas. Each section within a municipality should have a special function to perform towards the whole, due to its location and its topographical conditions. That a majority of all industries within a certain section are of a certain type does not necessarily prove that the zone considered should be restricted to the development of that class of manufacturing. To restrict sections solely according to existing improvements is to acknowledge the wisdom of individual efforts against coöperative planning. Ascertain from industries indiscriminately located in different sections the reason for their occupying such a location, and in a majority of cases it will be found that inducements offered thru land speculators were the sole or chief factor.

In almost any municipality there exists a boom for the development of a new section of the city, the section at the time being merely farm land. The reason for the enthusiasm is that within the existing industrial district there is no land available for large developments. In one of the larger western cities where a survey was made of the industrial section, it was found that 30 per cent of the area was occupied by firms which admitted that they could move without any inconvenience and would probably be better placed, from a productive standpoint, in some other location. There

United States Truck Tires

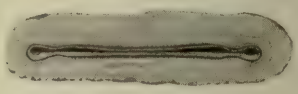
Are Good Tires

It is essential that you get GOOD tires and receive the kind of consideration and tire service that has so popularized UNITED STATES SERVICE STATIONS throughout the country.

Fire Hose and Pan-cakes!

Did you know that Bi-Lateral Fire Hose could be flattened out like a pan-cake without the least sign of cracking or breaking?

Bi-Lateral Hose is so constructed by an improved method, that the lining in its jacket is left free at the fold. This prevents the rubber from cracking, and the lining will last as long as the jacket. Bi-Lateral Hose Lasts Longest.



Write for printed matter.

BI-LATERAL FIRE HOSE CO.
326 W. Madison Street, Chicago, Ill.

Dayton Airless Tires

GUARANTEED 2½ YEARS

Made exclusively for Fire Department use.

Ride like Pneumatics
No Punctures
No Blowouts

Write for information

The Dayton Rubber Mfg. Co.
Dayton, Ohio

were also found vacant lots spotted here and there which equaled over 12 per cent of the section. The area occupied as mentioned and the vacant lots could be combined and developed for intensified manufacturing, greatly to the improvement of the whole section. If the contemplated scheme of developing the area of farm land for manufacturing purposes had been carried thru, the old industrial sections would have slowly developed into an "industrial slum," or in due time a "blighted" section. These slum areas would then react upon the commercial district and drive that section farther away. The result would be a deplorable condition from a standpoint both of morality and of real estate values. The city would then be growing in an unnatural way, for it would be building up new sections before it had fully developed its old district. Such a condition would result in a loss of revenue to the city and a loss of money to the individual property holder.

In order that proper guidance and control may be had over future development, there must be a "stock-taking" of the municipality, with analysis of the resources and economic conditions, and the preparation of a comprehensive plan for efficient and economical future development. To suggest what such an industrial survey should cover, let us take as a concrete example two cities, one eastern and one western.

City	Population	No. of Establishments	Wage-earners (Average Number)	Value of Product	Per Cent of Increase, 1909-14	
					Wage-earners	Value of Product
A	500,000	2,036	99,603	$400,347,912	22.9	58.3
B	700,000	3,138	78,894	284,802,479	6.7	16.3

These figures indicate that the smaller city has the larger number of wage earners and a much greater value of product in total and in rate of increase than the older and larger city. Figures as to value of product mean little, however, without a knowledge of the cost of materials brought from outside of the city which enter into the product. To make the figures valuable there must also be a comparison of topography, transportation facilities, rate of wages, cost of living, taxes, etc. To attract new industries, definite data must be available as to the supply of houses for workmen, health conditions, educational facilities, recreational advantages, etc.

The question resolves itself into the vital need of an industrial survey for efficient city planning. Such a survey would analyze carefully the questions already enumerated and would give special attention to the following subjects:

An analysis of the present transportation facilities, showing their advantages, needs and possibilities of future expansion.

An analysis of the transportation charges and plan for readjustment, so as to increase more effectively the interchange of commodities.

A study of the position of the municipality with respect to other commercial centers of the country.

A study of the position of the municipality as a center for certain types of industries, with analysis showing why and how certain industries should be developed.

An analysis of the industrial section and of existing industries, with plans for present and for future development.

An analysis of the labor condition in regard to present industries, together with suggestions as to the kind of labor necessary for certain industries which should be developed.

After such a survey has been carried thru and an analysis made, the municipality is then in a position for future development precisely as is a large industrial plant following its inventory and a study of the different departments with a view to present improvement and future betterment Some of these improvements may prove to be too urgent to postpone till after the war; while others might more wisely be undertaken as a means of stabilizing industrial conditions when the war is over. Municipalities in this country will be called upon after the war to do their share towards the commerce of the world and the industrial expansion of the nation; but until a thoro realization is felt of the need for industrial preparedness based upon efficient and economic operation, our position will be one of embarrassment in regard to present and after-war competition.

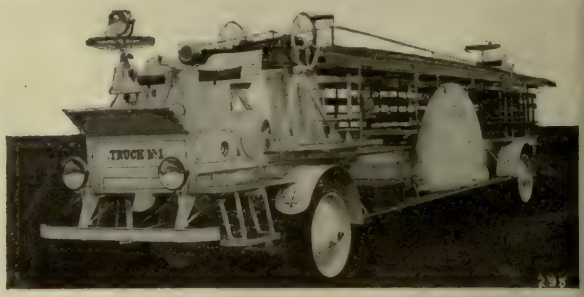
Industrial preparedness means the establishment of such relations between individual and community, between individual and government, as to create the hearty coöperation of all citizens to meet the need of the municipality and the whole country.

Four-Wheel Drive
Aerial Ladder Truck

Pneumatic Air Hoist
Automatic Ladder Lock

One man puts the ladders where you want them. **No More Cranking.**

Write for free booklet and list of users



COUPLE-GEAR FREIGHT-WHEEL CO., 525 Buchanan Ave., GRAND RAPIDS, MICH.

IS A LIFE WORTH $39.70 IN YOUR TOWN?

Every city but one in Iowa over 5,000 population has Lungmotor protection—for protection in cases of

Gas Asphyxiation,
Drowning,
Electric Shock,
Asphyxia at Birth,
Etc.

Total cost of Lungmotors $3,375—lives saved to dat 83—cost each life saved $39.70.

Remember every additional life saved, this cost is reduced.

What is it worth to save lives in your town?

Send for full information

LIFE SAVING DEVICES CO., 564 1-2 W. Monroe St., CHICAGO, ILLINOIS

Loper Fire Alarm Co.

STONINGTON, CONN.

Manufacturers of

Compressed Air Fire Whistles
Whistle Blowers
Bell Strikers, Boxes, Gongs
Etc., Etc.

Estimates Cheerfully Given

The Anderson Coupling & Fire Supply Company

KANSAS CITY, KANSAS

Manufacturers of

MOTOR FIRE APPARATUS
General Fire Department Supplies

Anderson-Hale Fire Station Door Openers

Estimates Cheerfully Given

THE GAMEWELL FIRE ALARM TELEGRAPH CO.

"Registered U. S. Patent Office"

Manufacturers of
Fire Alarm and Police Signal
TELEGRAPHS
for
Municipalities and Private Parties

The Gamewell system of to-day is the outcome of the combined inventive genius and mechanical skill of many whose valuable services the company has been able to secure during the past fifty-seven years, in pursuance of its policy of meeting at any cost the requirements of the varied conditions existing in different localities.

Correspondence Solicited.

General Office and Works:
Newton Upper Falls, Mass.

Items of Municipal Law

By A. L. H. Street

Municipal Water Plants

A municipality engaged in operating a water plant to distribute water for private consumption is governed very largely by the same rules of law that apply to private corporations engaged in the same service to the public, so far as concerns discrimination between consumers. The city is not, however, bound to maintain absolute equality in service or rates, altho there can be no unjust or unreasonable discrimination between patrons; so, where a state normal school or other public educational institution is situated in a city, the municipality may validly donate all water needed by it, as against objections of municipal taxpayers. (Oklahoma Supreme Court, Fretz vs. City of Edmond, 168 Pacific Reporter, 800.)

A city's powers do not extend beyond the corporate limits except as extended in express or implied terms by its charter or legislative authority. Hence, a city possessing charter authority to maintain a plant to afford "a complete and sufficient supply of reasonably pure and clear water to said city," has no power to distribute water to patrons beyond the city limits, altho the charter also provides authority for the acquisition of water rights and works outside such limits. And, having inaugurated unauthorized service beyond city limits, the municipality may validly discontinue it. (Georgia Supreme Court, City of Gainesville vs. Dunlap, 94 Southeastern Reporter, 247.)

✣ ✣

Duty to Light Streets

Affirming judgment against the city of Rock Hill, S. C., in favor of one Sexton who was injured while riding a bicycle to work before daylight, thru collision with an automobile at a street intersection, the South Carolina Supreme Court holds that a city may be deemed to have been guilty of such negligence as renders it liable for such an accident where it has either failed to maintain street lamps along much-traveled thorofares in thickly settled communities, or has failed to keep burning at proper times a lamp so maintained. (93 Southeastern Reporter, 180.)

Some confusion as to the law of such cases has existed for several years. It has been decided by numerous courts that the common law does not require municipal lighting of streets, and that therefore a right of action for personal injuries sustained in the night-time could not be founded solely upon neglect of a city in this respect. It has been further held that the mere fact that a municipality is given charter authority, without charter obligation, to light its streets does not create liability in instances of the kind mentioned. But other courts have qualified these rules by limiting them to streets that are reasonably safe for travel without lighting, and have decided that dangerous conditions in ways might render omission of light actionable negligence. The Illinois Supreme Court is one of the tribunals which has held that failure to light a street might be regarded as negligent in peculiar circumstances under which due care calls for lighting.

The Supreme Court of South Carolina seems to reflect the trend of the latest decisions on the subject when it says:

> "It would be a fruitless task to recite the many divergent conclusions which the courts of many states have reached about a city's liability for torts of the character which the instant case illustrates. When many of the decisions were made there were no electric lamps capable of instant ignition over the total area of a city by the sudden movement of a lever, there were no bicycles, and there were no ponderous, perilous and swift-moving cars driven by licensed and unlicensed persons and propelled by their own engines along the country's highways, by day and by night. These circumstances might call for the lighting of much-traveled highways in thickly settled communities. Duties spring out of obligation and circumstance. The first is unchanging law, and the second is ever-changing facts. The failure to so light might under the circumstances render the way 'defective.' . . . And beyond all peradventure, when the lighting plant belonged to the city, and the city saw the need of a lamp at the locus in question, and put the lamp there, and lighted it on occasion, then a negligent failure to light it on the instant occasion would be 'mismanagement' of the lamp."

Concrete Posts Concrete Posts

When you buy STAR Concrete Lighting Posts, or Drinking Fountains, or Sun Dials, or Flower Urns, or Park Benches you buy QUALITY as well as the article itself. You buy long enduring service; you buy a product that is probably BETTER for its purpose and use; you buy highest quality in materials, design and workmanship. Our goods are made in heavy cast iron molds, reinforced with steel rods, of a mixture of materials and by a process known only to ourselves. The strength of our products equals and the appearance is similar to GRANITE

Type A

Fountain Designs are same as Posts

Type No. 1

Post Designs are same as Fountains

Type B

GOOD LIGHT STIRS PATRIOTIC ENTHUSIASM

We carry full line of globes and fixtures.

Type No. 2

Illustrations here display only a few articles manufactured by us. We suggest writing for our new seventy page catalogue which shows our complete line.

Type No. 3

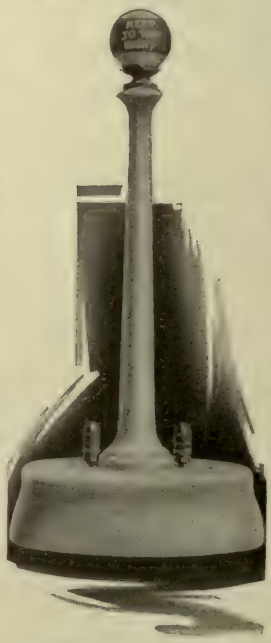
Prices quoted complete inst lations.

Iron conduit for wires runs through center of each post. Sizes range from one to two inches according to requirements.

Reinforcing rods run throu entire length of post and exte eighteen inches below base—th rods are then used as *Foundation Bo*

Type D

Every article manufactured by us is guaranteed and will last a lifetime.



Safety Island Post

Compensators, high or low tension, multiple or series systems, Type C or any lamps or fixtures can be fitted to our posts.

Type G

CHICAGO CONCRETE POST COMPANY

608 So. Dearborn Street :: Chicago, Ill.

Municipal and Civic Publications

CITY PLANNING CONFERENCE.

Proceedings of the Ninth National Conference on City Planning, Kansas City, Mo., May 7-9, 1917. 1917. 314 pp. Illustrated. **$2.15**

A glance thru this volume suffices to show the increasing emphasis placed by city planners on the problem of transportation—the providing of facilities for moving men and materials from place to place within the limits of our overcrowded municipalities. Some of the matters discussed are: interurban passenger terminals; industrial terminals; street widening; traffic ways; treatment of water courses; park and boulevard systems; planning small cities; state campaign for city planning; how the real estate man can help; districting and zoning; relation of city planning to business; building heights; elastic streets; city planning under war conditions; location of public buildings.

CANADIAN COMMISSION OF CONSERVATION.

Urban and Rural Development in Canada. (Report of Conference Held at Winnipeg, May 28-30, 1917.) 102 pp. (Apply to the Commission, Ottawa, Can.)

This is the report of a conference under the joint auspices of the Civic Improvement League of Canada and the Commission of Conservation, associated with many local organizations interested in better housing and living conditions for Canada. The pamphlet contains many interesting papers, among which are the following: "Municipal Problems of the Western Provinces," by Hon. W. J. Armstrong; "Municipal Finance and Administration," by Dr. H. L. Brittain; "Municipal Finance and Administration," by C. J. Yorath; "Municipal and Vital Statistics," by R. H. Coats; "Rural Production and Development," by Dr. Jas. W. Robertson; "Civic Efficiency and Social Welfare in Planning of Land," by W. F. Burditt; and "Planning and Development of Land," by Thomas Adams.

MERRIMAN, MANSFIELD, Mem. Am. Soc. C. E.

Elements of Sanitary Engineering. (Fourth Edition, Revised with the Assistance of Richard M. Merriman.) 1918. 250 pp. Tables, diagrams. **$2.15**

The revised edition of this standard work should be of interest to municipal officers in charge of sanitary works and to the public in general, as it presents the guiding principles which should be observed in order to secure a pure water-supply and an efficient sewerage system. The book consists of six chapters and an appendix. The first section deals with sanitary science in general; the second with water and its purification; the third with water-supply systems; the fourth and fifth with sewerage systems and the disposal of sewage; the sixth treats the refuse and garbage problem. The appendix contains articles on the new water-supply for New York City; water filtration at Philadelphia and at Little Falls, N. J.; the Chicago drainage canal; British commissions on sewage disposal.

MORSE, RICHARD.

Fear God in Your Own Village. 1918. 212 pp. **$1.45**

The preface informs us that this "is a true story of an attempt to put the fear of God into an American rural community; that is, to bring order out of the chaos of its social and civic affairs, to put pride and coöperation in the place of suspicion and individualism, to make narrow prejudice and plain cussedness give way to sympathy and unselfish service."

ADAMS, THOMAS, Town Planning Adviser, Commission of Conservation, Ottawa, Canada.

Rural Planning and Development: A Study of Rural Conditions and Problems in Canada. 1917. 289 pp. Photographs, maps, diagrams, charts. **75 cents**

The author's conception of city planning is a thing so broad as to seem almost new. In referring to rural problems, the following needs are emphasized: (1) the planning and development of land by methods which will secure health, amenity, convenience and efficiency, and the rejection of those methods that lead to injurious speculation; (2) the promotion of scientific training, improved educational facilities and means of social intercourse; (3) the establishment of an efficient government organization and improved facilities for securing coöperation, rural credit, and development of rural industries. The chapter heads are: rural population and production in Canada; rural transportation and distribution—railways and highways; rural problems in connection with land development; organization of rural life and rural industries; government policies and land development; returned soldiers and land settlement; provincial planning and development; legislation, outline of proposals and general conclusions. There are also five important appendices.

FRANC, ALISSA.

Use Your Government. What Your Government Does for You. 1918. 390 pp. Photographs, charts, maps. **$2.20**

Civic and social workers, municipal officials and chamber of commerce secretaries have long realized that the Federal Government is ready to be of assistance in many ways, but the problem has been to know *what* ways and the proper source to address. This book tells in an interesting way how the Government is ready to be of service along many lines, some of which are indicated by the following subjects treated: agricultural methods; insect extermination; weather reports; roads; farm management; rural schools; irrigation; forest service; geological survey; industrial studies; employment service; community organization; teaching citizenship; school and home gardening; food inspection; and child welfare.

UNWIN, RAYMOND, F. R. I. B. A.

Nothing Gained by Overcrowding. How the Garden City Type of Development May Benefit Both Owner and Occupier. (Foreword by The Rt. Hon. The Marquis of Salisbury.) 1918. 23 pp. Photographs and diagrams.. **12 cents** (postage and duty extra)

A study of the garden city movement in England, with important practical recommendations of interest to American municipalities now faced with the necessity of providing additional housing facilities.

HOWE, FREDERIC C., Ph. D., LL. D., Commissioner of Immigration at the Port of New York.

The High Cost of Living. 1917. 285 pp. **$1.75**

It is Dr. Howe's opinion that monopoly is responsible for the present-day food problem. If we are to reduce the high cost of living we must have: freedom of access to the hundreds of millions of acres of land that are held out of use; freedom of access to adequate transportation; freedom in distribution, in marketing, in competition all along the line.

WATER PURIFICATION

Gravity and Pressure Filters, and Chemical Feeding Devices

Operating Floor of Filtration Plant at Akron, O.

Original installation made in 1913, capacity 20,000,000 gallons daily

Plant increased 50% within 4 years, testifying to the merits of the **WHEELER FILTER BOTTOM.**

Over 450 municipal plants installed—total daily capacity **One Billion** gallons.

The New York Continental Jewell Filtration Co.

General Office and Works: NUTLEY, N. J.

111 W. Monroe St., Chicago **New Birks Bldg., Montreal**

OTIS, EDWARD O., M. D., Professor of Pulmonary Diseases and Climatology, Tufts College Medical School.

Tuberculosis: Its Cause. Cure and Prevention. (Revised edition of "The Great White Plague.) 1918. 348 pp. Illustrated. **$1.70**

ALBAUGH, BENJAMIN F.

Home Gardening: Vegetables and Flowers. 1917. 138 pp. Photographs. **90 cents**

The nation-wide movement to increase the food supply of the nation by the utilization of back yards and other waste places has aroused a great demand for literature furnishing practical suggestions as to methods of procedure. This book has been reissued because it meets so completely the needs in this line of the city-bred individual who desires to undertake back-yard farming.

Light and Power Rates in Cleveland.
The Cleveland Electric Rate Case. By F. W. Ballard. (Reprint from *The Utilities Magazine*, February, 1917.) 26 pp. Chart, tables. (Apply to F. W. Ballard & Co., Swetland Building, Cleveland, Ohio.)

Seattle Juvenile Court Report.
The Seattle Juvenile Court Report for the Year 1917. An interesting study of juvenile delinquency and pension problems, with statistics. 1918. 22 pp. (Apply to Earl F. Conner, Clerk of the Court, Seattle, Wash.)

Union of Manitoba Municipalities.
Report of the 14th Annual Convention, held at Winnipeg, Man., November 27-29, 1917. 1917. 69 pp. (Apply to Robert Forke, Secretary-Treasurer, Pipestone, Man.)

Sanitary Inspection of Slaughter Houses.
This pamphlet is being issued as Bulletin No. 209 of the Kentucky Agricultural Experiment Station, University of Kentucky, Lexington, Ky. By J. O. LaBach and W. H. Simmons. 1917. 32 pp. (Apply to the Agricultural Experiment Station, as above.)

Social Hygiene and the War.
By William F. Snow. A reprint of Dr. Snow's article in *Social Hygiene*, issued as Publication No. 108 of The American Social Hygiene Association. 1917. 33 pp. (Apply to the Association, 105 West Fortieth Street, New York City.)

Campaigning Against Industrial Evils
is the title of a booklet, accompanied by printed folders on the minimum wage question, prepared by the Consumers' League of the City of New York. It contains the Report of the League for 1917. 1917. 20 pp. (Apply to the League, 105 East Twenty-second Street, New York City.)

Highway Accidents in New York City.
By Shirley W. Wynne, M. D. Reprinted from the New York *Medical Journal* for December 22, 1917. Charts, tables. 1917. 11 pp. (Apply to author, 255 West Ninety-eighth Street, New York City.)

Social Problems in Rochester.
Abstract of a Report on the Department of Charities of the City of Rochester, N. Y. Survey by Francis H. McLean. 1918. 44 pp. Tables. (Apply to the Rochester Bureau of Municipal Research, Inc.)

The Washington Traffic Situation.
Report on the Washington Traffic Situation to the Public Utilities Commission of the District of Columbia. Section 1, January, 1918. By John A. Beeler, Consulting Engineer. 59 pp. Blueprints. (Apply to Commission, Washington, or to author, 52 Vanderbilt Avenue, New York City.)

Labor Legislation in 1917.
Review of Labor Legislation in 1917. *The American Labor Legislation Review*. September, 1917. 92 pp. (Apply to Dr. John B. Andrews, Secretary, American Association for Labor Legislation, 131 East Twenty-second Street, New York City.) $1.00.

KELLOGG, VERNON, and ALONZO E. TAYLOR, both of the United States Food Administration.

The Food Problem. (Preface by Herbert Hoover.) 1917. 229 pp. **$1.45**

Mr. Hoover says in his preface: "Professors Kellogg and Taylor have attempted in this book to set out the character and scope of the food problem as it now immediately concerns us, and to indicate the possible and most promising methods of its solution."

ATHEARN, WALTER SCOTT, Professor of Religious Education, Boston University.

Religious Education and American Democracy. 1917. 407 pp. **$1.65**

Cincinnati Social Unit Organization.
Bulletin No. 3 of the National Social Unit Organization, describing the demonstration "unit plan" in operation in Cincinnati. 1918. 15 pp. (Apply to the Organization, 1820 Freeman Avenue, Cincinnati, Ohio.)

The World's Food.
Under this title the American Academy of Political and Social Science has issued an unusually interesting and valuable number of its *Annals*, bearing on the world food situation. (No. 163, November, 1917.) Charts, tables. 1917. 313 pp. (Apply to the Academy, Concord, N. H.)

Report on the Austin Dam.
Report on the Dam and Water Power Development at Austin, Texas. By Daniel W. Mead, Consulting Engineer, Madison, Wis. Photographs, charts, diagrams, statistics. 1917. 213 pp. (Apply to author, Madison, Wis.)

Indianapolis City Government Survey.
The Government of the City of Indianapolis, Ind., and of Marion County. Survey Report prepared for the Indianapolis Chamber of Commerce by the Bureau of Municipal Research, New York. Price, $3.50, delivered. Photographs, report forms, charts, tables. 1917. 578 pp. (Apply to the Indianapolis Chamber of Commerce, Chamber of Commerce Building, Indianapolis, Ind.)

One Hundred Years of Savings Banking.
This is the title of an interesting and valuable booklet by Edward L. Robinson, Vice-President, Eutaw Savings Bank, Baltimore, Md. A comprehensive bibliography on Thrift is included. 1917. 89 pp. (Apply to Savings Bank Section, American Bankers' Association, M. W. Harrison, Secretary, 5 Nassau Street, New York City.)

Bridgeport Municipal Register.
A 567-page book containing the Mayor's messages, annual reports of the various departments and officers of the city, list of city officers and appointments, new ordinances and amendments, and other matters of a public nature. Tables, charts, statistics. 1917. (Apply to Bernard Keating, City Auditor.)

Municipal Reports of Savannah.
Municipal Reports, 1916, City of Savannah, Ga. Charts, tables, statistics. 1916. 1917. 627 pp. (Apply to Thomas Halligan, Clerk of Council.)

Industry and Employment in New York City.
Report of the Committee on Industry and Employment. Mayor's Committee on National Defense, December 21, 1917. 44 pp. (Apply to Committee as above.)

Problems of the University Municipal Research Bureau.
Problems of University Bureaus of Municipal Research and Reference. Interesting issue of University of Texas Bulletin (No. 1749, September, 1917), containing also the Second Biennial Report of the Bureau of Municipal Research and Reference, 1915-1917. 36 pp. Illustrated. (Apply to the University, Austin, Tex.)

Health Insurance.
Health Insurance: A Positive Statement in Answer to Opponents. (With Supplemental Bibliography.) Issued as December, 1917, number of *The American Labor Legislation Review*. 62 pp. (Apply to Dr. John B. Andrews, Secretary, American Association for Labor Legislation, 131 East Twenty-third Street, New York City.) $1.00.

SANITATION

While our "CANCO" garbage can in point of appearance and strength of construction is without a peer, yet our equipment—the most comprehensive in the country—is such that we can make any desired sort of garbage container.

TRADE CANCO MARK

AMERICAN CAN COMPANY

NEW YORK

Chicago Toledo San Francisco

With Offices in All Large Cities

Methods, Materials and Appliances

News for Boards of Public Works, Engineers, Contractors, Purchasing Agents and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

NEW FILTER MANUFACTURING PLANT AT NUTLEY

New Plant for New York Continental Jewell Filtration Company

Confronted with the necessity of securing more factory space than their Jersey City plant could afford, to take care of their increasing business, the New York Continental Jewell Filtration Company has erected a large plant at Nutley, N. J., on the Newark Branch of the Erie Railroad. Here the company will occupy a unit of six brick buildings, where it will manufacture its full line of filters and water purification apparatus. The buildings are so arranged as to handle the products in the order of the progress of their manufacture. Private siding tracks from the Newark Branch of the railroad run the entire length of the plant, connecting the various buildings. Ample storage accommodations have been provided for a large stock of raw and finished materials, with a view to filling all orders as promptly as possible. The entire plant occupies an area of approximately 220,000 square feet. Intelligent planning of the operating space, good ventilation and excellent lighting look to the welfare and efficiency of the employes. A feature of this plant which makes for effective coöperation between the administrative and working forces of the company is the concentration of all departments in this one central plant. One of the six buildings is given over to the general and executive offices of the company. Next to that is a well-equipped building which houses the Engineering Department and its accessories. In the next, or main, building are the works office, the estimating department, the record room and their subsidiaries, and also the stock rooms, shipping and receiving department, carpenter shop, assembling and testing room, pipe shop, machine shop, tool and locker rooms. The other buildings accommodate stock rooms, auxiliary power plant for emergency use, boiler room, laboratories and other minor departments.

It is an interesting fact that, altho the company has more than doubled its facilities, overhead expenses have been materially decreased, largely on account of the fact that the executive, sales, and manufacturing departments of the business are no longer separately housed, but are in constant communication.

✣ ✣

Cutting the Cost of Cutting Grass

It is not the purpose of this item to point out the superiority of motor-driven over horse-drawn lawn mowers. Experience has settled that question. The short turning radius, greater speed, and lower cost of operation of the former are winning for it a steadily increasing popularity among park officials and owners of large estates.

The power lawn mower pictured is made by the Milbradt Manufacturing Company, St. Louis, Mo. There are a number of unusual features worthy of mention in this machine. In the first place, it will be noted that the mower drives like an automobile, with all the controls at the side of the operator. Its speed is twice

MILBBRADT POWER LAWN MOWER

DUTY RECORDS MADE HERE

This is the John Street Pumping Station, Toronto, containing three De Laval Geared Steam-turbine-driven Centrifugal Pumps, each of a capacity of 24,000,000 Imperial gallons per 24 hours against 268 ft. head.

World's records for duty of steam-turbine-driven centrifugal pumps have been made here on two occasions. The first test was made in 1914, when Prof. Robt. W. Angus of the University of Toronto, found that the first unit delivered 130,449,000 ft. lb. per 1000 lb. of commercially dry steam at 148 lb. gage initial steam pressure.

Two similar De Laval units, each capable of delivering 24,000,000 Imperial gallons per day against 268 ft. head have since been purchased for the same station. One of these, tested by Prof. Angus on March 8, 1917, developed 153.92 million ft. lb. per 1000 lb. of commercially dry steam at 148.4 lb. gage initial steam pressure. Making allowance for auxiliaries, the duty of the bare machine is 160.5 millions ft. lb. per 1000 lb. of steam.

The De Laval Steam-turbine-driven High pressure Centrifugal Pumps now installed for the City of Toronto aggregate 100 million Imperial gallons capacity per day.

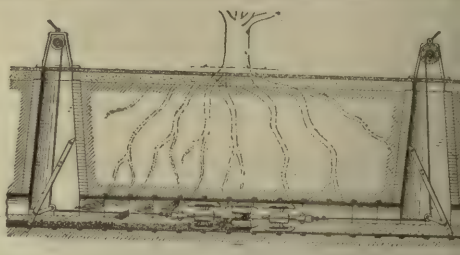
Have you read our booklet on "Progress in Water Works Pumps?"

DE LAVAL

STEAM TURBINE CO.

Trenton New Jersey

298



B. M. E.

Sewer Cleaners

(Patented)

Guaranteed to remove all deposits—obstructions—and tree roots.

They have never failed to make good.

Sewers cleaned by contract.

Write today

Buffalo Municipal Equipment Co

Mutual Life Bldg. Buffalo, N. Y

NEW YORK CHICAGO

Keystone Arctic
Keystone Compound
Eureka Utility

COLUMBIA, S.C.

Water Meters

Pittsburgh Meter Co.

East Pittsburgh, Pa.

LOS ANGELES SEATTLE

Power with Less Coal

Now more than ever before is it good business for the individual industrial plant to operate power and light equipment with the least possible fuel, owing to the present high cost of coal.

Furthermore it has been demonstrated that it is a necessity for our country to reduce the total consumption of fuel to the lowest possible point.

It is a recognized fact that Gas Power Plants operate on far less fuel than any other form of power plant.

THE BRUCE-MACBETH ENGINE CO.
2137 Center St. N. W., Cleveland, O.

UPPER SERVICE STATION, FILTRATION PLANT, BALTIMORE, MD.

The equipment includes three Class A, 8-inch R. D. Wood & Co. pumps, each driven by a 75-horse-power, 1,440-r. p. m. Westinghouse motor; and two 10-inch Class A pumps, each driven by a 200-horse-power motor. The manufacturers received a goodly bonus on these pumps because they considerably overran their guaranteed efficiency.

the gait of a horse. It cuts a swath 38 inches in width, and can be easily manipulated in shrubbery and groves of trees which would be impassable to a horse machine. The cutting cylinder, it will be seen, extends on either side beyond the body of the mower. This makes it possible to cut close to the base of trees and shrubs. One of the two levers by the driver's side controls the cutting cylinder. When this is raised, it is automatically disengaged from the clutch, and ceases to revolve, thus saving power. The other lever operates the transmission clutch. The motor is built by the Missouri Engine Company, and is equipped with an improved radiator and fan system. A patented gearless differential prevents the rollers from slipping, and enables the mower to climb grades as steep as 35 per cent.

It will be noted that the large roller is ribbed. The purpose of this ribbing is to loosen up the earth in the path of the mower, so that the grass will grow faster and more luxuriantly. The whole machine weighs about 1,000 pounds. Simplicity is aimed at in every detail, so that there are practically no parts to get out of order. No live park official should fail to investigate this efficient time-saver.

Satisfactory Use of Pitometer

Practical experience is the only real basis for judgment as to the merits of an instrument. For this reason the following letter from the Water Commissioner of Buffalo, N. Y., will be of particular interest to waterworks officials who have been struggling with the problem of water waste:

"The city of Buffalo has authorized the Commissioner of Public Works to enter into contract with The Pitometer Company for survey of the entire city —75 per cent of which is to be completed by January 1, 1919. From the trial sections which The Pitometer Company did for the Bureau of Water this summer, it is estimated that the consumption will be reduced from 171,000,000 gallons per day to approximately 115,000,000 gallons per day, with a consequent saving of 18,000 tons of coal per year."

(Signed) GEORGE C. ANDREWS,
Water Commissioner.

The Pitometer Company, 55 Duane Street, New York City, will be glad to send literature on the subject of Pitometer surveys to any who may be interested in the matter. It is probable that the fuel shortage next winter will be as great as it was during the winter just passed, and for this reason, as well as others, every effort should be made to cut

SIGNS

All kinds of durable and ornamental signs.

Street Names, *Catalog B*
Road Direction
Park
Warning } *Catalog C*
Traffic, *Catalog D*

Catalogs illustrated in colors, send for any one or all of them.

JOSEPH N. EARLY
Est. 1861
Patentee and Manufacturer
320 Broadway :: New York

King Poles and G. E. tops make the best lighted streets

Send for our beautifully illustrated booklet—free. Send name and address today.

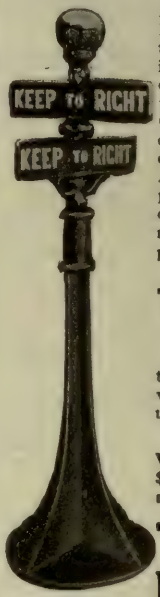
KING FOUNDRY CO.
55 W. Jackson Blvd.
Chicago, Ill.

ATLANTIC PUMPING ENGINES

Send for 1918 Catalog

HAROLD L. BOND COMPANY, 383 W. ATLANTIC AVE. BOSTON, MASS.

The Leb-Iron Traffic Sig



Wt. of Base, 150 lbs.
Total Wt., 225 lbs.

A Substantial, Efficient, Sile Policeman. The words "Keep-t the-Right" are in 2½ and 1 inch letters, rounded and sta out a half-inch from the boar which are covered with Red Green smalts as desired. T covering is carefully baked electric ovens, insuring long li A 7-inch Red or Green Globe placed on the top, which is abo on the level with the chauffeu range of vision. It cannot passed unnoticed.

The Base Weigh 150 Pounds

the complete sign, 225 lbs. Pr vision is made for wiring fro underneath or overhead.

Price complete, includir Wiring Lamps and Fixture $20; plain, with provision f attaching Lantern, $16.

The Lebanor Machine Co
Lebanon, N. H.

Street Signs Road Guide Post Traffic Signs

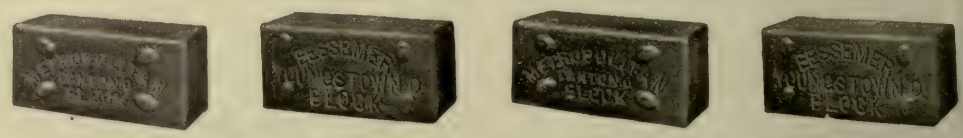
The Kind That Last

Made of Heavy Galvanized Iron wit letters sunken into plate.

If you are looking for *permane* signs instead of the short lived ord nary variety write to us for price illustrations and further particular

Union Iron Products Co
Drawer H-2 E. CHICAGO, IN

BEST PAVING BRICK MADE



THE METROPOLITAN PAVING BRICK COMPANY
"THE WORLD'S LARGEST"
CANTON, OHIO

LEAK IN BUFFALO WATER MAIN DISCOVERED BY PITOMETER SURVEY

down power wastes which mean unnecessary fuel consumption.

Motor-Driven Pumps Show High Efficiencies

A test of the two 12-inch motor-driven centrifugal pumps recently installed at the McCarren Pumping Station of the St. Paul, Minn., Water Department will be of interest to waterworks officials. The pumps are of the De Laval single-stage, double-suction volute type, without diffusing vanes, made by the De Laval Steam Turbine Company, Trenton, N. J.

The specifications required that each unit should be guaranteed to deliver not less than 5,000 U. S. gallons per minute against a total head of 171 feet, and not more than 5,500 gallons against a total head of 158 feet, the overall efficiency from "wire to water" to be not less than 72 per cent when pumping continuously at either of the heads and deliveries. It was further required that when delivering against a reduced head of 140 feet the motor should not be overloaded.

The bid of the Northwestern Electric Equipment Company, of St. Paul, which was accepted, offered the De Laval pumps here pictured, driven by synchronous motors of the rotating field type at a speed of 1,200 r. p. m. These motors receive three-phase, 60-cycle current at approximately 2,200 volts, and are so designed that they can be started by the application of alternating current to the armature windings.

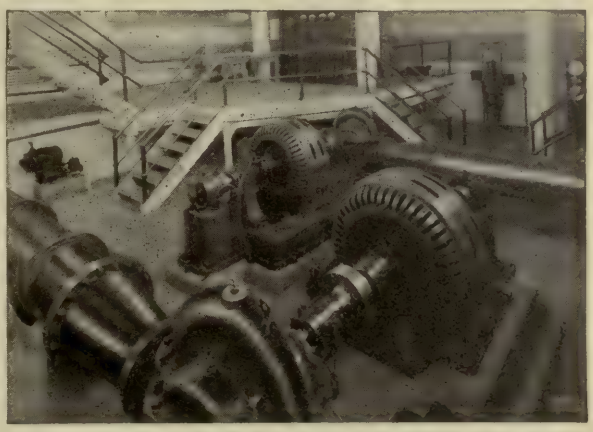
In running the test, the head against which the pumps worked was controlled by means of a hydraulic gate valve on the discharge side of the pumps. After throttling the gate valve, no readings were taken until all instruments had ceased fluctuating, after which two or three readings were made and averaged, if any variations were found. Observations were made with the pumps operating under four different heads, covering a wide range of delivery. The results obtained on the official test are shown in the tabulation given below. In computing the efficiencies of the pumps alone, motor efficiencies, as obtained on tests of the motors by the University of Minnesota, were used. On motor No. 403115 the following efficiencies were obtained: full load, 95.5 per cent; ¾-load, 94.9 per cent; ½-load, 93 per cent. Motor No. 403129 gave the following results: full load, 95.3 per cent; ¾-load, 94.6 per cent; ½-load, 92.5 per cent.

The efficiencies obtained on these pumps are quite high, considering the comparatively small capacity and the high head, and are, further, very high over a considerable range in capacity. Pump No. 25651, for instance, showed an efficiency of 81.8 per cent at 6,527 G. P. M., and at 4,097 G. P. M. showed an efficiency of 77.0 per cent. This means a reduction of only 5.9 per cent in efficiency for a reduction in capacity of about 37 per cent, and must be considered very good for a centrifugal pump.

Mr. G. O. House, General Superintendent of the Bureau of Water of St. Paul, recently stated that the high efficiency revealed by the official test has since been maintained in practice. Since June, 1917, the pumps have been operating at an efficiency very closely approximating the test efficiency, and the units are giving perfect satisfaction.

Front Cover Photograph

For the photograph reproduced on the front cover of the Town and County Edition of this issue, credit is due The White Company, of Cleveland, Ohio.



CENTRIFUGAL PUMPS AT THE McCARREN PUMPING STATION, ST. PAUL, MINN.

Lawn Beauty with Economy and Conservation of Labor

Under ordinary conditions, hand mowing is inefficient and expensive. This year, with labor at a premium and almost impossible to obtain, hand mowing is prohibitive.
The solution to the lawn cutting problem is the

FULLER & JOHNSON
MOTOR LAWN MOWER

The Fuller & Johnson Mower combines the convenience of a hand mower with large cutting capacity. In one day's time one man can cut five acres of lawn with the Fuller & Johnson. He can cut it so perfectly that no after-trimming around trees, shrubs or driveways will be necessary. He can cut it when needed instead of waiting, as with a horse mower, until the turf is solid so that the lawn won't be marred by the horse's hoofs.
This is what the Superintendent of the Park District of Oak Park, Ill., has to say about the Fuller & Johnson:

> "Replying to your inquiry of July 5th, we are glad to say that the Fuller & Johnson Motor Lawn Mower which we purchased from you a few months ago has been in constant use, has required very little repairs and has been in every way very satisfactory, so much so that were we in the market for another machine of this type, I am sure we would not hesitate to purchase another of this kind."

All over the country, in parks, cemeteries and on large estates, Fuller & Johnson Motor Lawn Mowers are fast replacing hand mowers, horse mowers and the heavier types of motor mowers. Where you find the most beautifully kept lawns there too you will find the Fuller & Johnson Mowers, for good business judgment as well as lawn beauty dictate their use. Let us send you complete details about the Fuller & Johnson. Write for a copy of our new book entitled "A Better Lawn."

MANUFACTURERS DISTRIBUTING CO.
473 Fullerton Building St. Louis, Mo.

SIXTY-FIVE PERCENT

of the freight between Cleveland a
Akron, Ohio, is transported over a bric
paved highway.

Can any city afford to be without t
dependable and economical commerc
transport that brick highways make po
sible?

Send for country road and city stre
specifications and other data.

Only your request is necessary.

NATIONAL PAVING BRICK MANUFACTURERS ASS'N · NPBMA · Pave with Brick

NATIONAL PAVING BRICK
MANUFACTURERS ASSOCIATION

WILL P. BLAIR, Secretary

831 Engineers Building, CLEVELAND, O.

Mr. Bond to Assist U. S. Shipping Board

Harold L. Bond, President of the Harold L. Bond Company, Boston, Mass., has been appointed Manager for the New England district of the division of production, U. S. Shipping Board, Emergency Fleet Corporation. This division has direct jurisdiction over all contracts for equipment placed with New England manufacturers, whether the material is intended for ships being built in New England or in other parts of the country. Mr. Bond will devote all his time to this work.

Worthington Corporation's New Executive

The recent election of Charles Philip Coleman as President of the Worthington Pump & Machinery Corporation, 115 Broadway, New York City, calls attention to this large industrial enterprise and to the new executive, who has had experience which exceptionally fits him for the position.

Mr. Coleman is a native of Baltimore, where he received his early education. He studied for a time at the Virginia Military Institute and the Shenandoah Valley Academy, and later entered Lehigh University, from which he graduated with the degree of M. E. From the University he entered the employ of the Lehigh Valley Railroad, where he served variously as Car Agent, Chemist, Engineer of Tests, Assistant to General Superintendent and General Storekeeper until 1903, having left the Lehigh for two years during this time to serve the Bethlehem Steel Company as Purchasing Agent and Assistant to the President. Later he was made General Purchasing Agent of the Lehigh, with headquarters in New York.

The Singer Sewing Machine Company made Mr. Coleman its Secretary and Treasurer in 1903, and during his incumbency of this position he had charge of the construction of the Singer building. He left the Singer Company to become President of the Saurer Motor Company, and later of the International Motor Company. In 1913 he came to the International Steam Pump Company as Vice-President, and upon its failure, due to war conditions, became its sole receiver in 1915. He handled its affairs in so satisfactory a manner in the interim which elapsed before its reorganization in 1916 as to receive a warm commendation from the United States Court. After the reorganization into the present Worthington Pump & Machinery Corporation the vice-presidency was again given Mr. Coleman, and he continued in that position until his recent election as President.

A Well-Protected Water Tower

A recent issue of *Graphite*, the house organ of the Joseph Dixon Crucible Company, Jersey City, N. J., shows the water tower owned by the city of Richmond, Va. This tower, as shown in the illustration, is 162 feet high. The tank is 30 feet high and 30 feet in diameter, with a capacity of 160,000 gallons.

When the question of protecting the steel

WATER TOWER AT RICHMOND, VA.

work of the tower from rust and corrosion by the storms came up, Dixon's Silica-Graphite paint was selected. This paint is the product of many years of study and experience, and is made to impart a tough, weatherproof and lasting protective coat to steel structural work exposed to the elements.

The Paint Department of the Dixon Company will be glad to furnish literature and expert advice on paint protection of property.

Underground Sprinkler Systems For Public Greens

W. A. Buckner, 1051 T Street, Fresno, Cal., has designed a sprinkler that can be very effectively used where the needs for constant watering and the area of the space to be irrigated warrant the installation of an underground system of piping. The sprinkler head is designed to be set flush with the soil, so that it will not have to be moved when the grass is mowed, or be in the way on golf greens or park lawns. The outstanding advantage of this sprinkler lies in the fact that it is adjustable to deliver any desired quantity of water. This makes it especially desirable, as all parts of the lawn or green do not require the same amount of water. The pressure, however, is the same at all parts of the system, and water is delivered, if so desired, with the same force at the point farthest from the source of supply as at the nearest.

The pressure adjustment is made by inserting a knife blade or screw-driver in the opening in the head of the sprinkler and turning a screw which controls the sprinkling vent. The

MUNICIPAL SURVEYS

A quick and effective way for city and county governments to reduce expenditures, increase revenues and give more and better service. Special attention to

Salary Standardization
Accounting
Audits
Charter Drafting
Budget Systems
Police and Fire
Highways
Health and Charities
Institutions
Schools
Public Utility Service and Rate Studies
Refuse Collection and Disposal
Methods of Taxation, Etc.

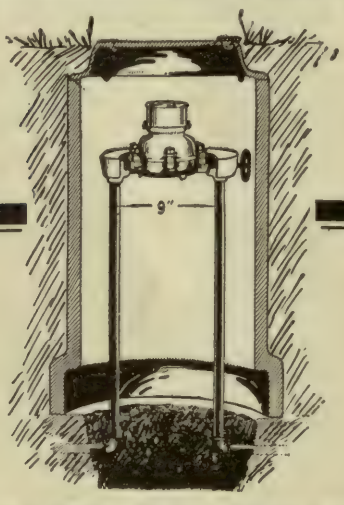
12 years' experience throughout U. S. and Canada. Write for literature. Estimates furnished.

BUREAU OF MUNICIPAL RESEARCH, 261 Broadway, New York City

Hooray! They're Makin' a Playground!

That's why the kids are so happy. They know that a playground in their vicinity will mean no end of fun for them. You can make all the kids in your town happy. Write me for printed matter on how to plan and equip a model playground.

HOWARD GEORGE
Philadelphia - Pa.
"The Playground Outfitter"



EASY-TO-READ

Hinged Lid Meter Setting

Guaranteed to protect meter from freezing if installed according to instructions. Meter is easy to read and easy to remove. Will save you money in installation and in service.

Write for full information.

LEWIS McNUTT
28 McNutt Bldg., Brazil, Indiana

THE AMERICAN CITY

has been awarded an "Honor Flag" by the Liberty Loan Committee of New York City on account of the fact that over 90% of the officers and employees have taken bonds of the Third Liberty Loan. To give the exact figures, 27 out of the 29 people on The American City staff have subscribed for bonds and the other two failed to do so only on account of the fact that the payments they are making on previous Liberty Bond issues made it impossible for them to do anything more right away.

distribution of water can be varied from a light mist to a heavy shower at will.

The heads are made of solid aluminum and brass, and will not corrode or leak. Water is delivered in a circle 20 to 25 feet in diameter, or in a half-circle of a corresponding proportion. A variation of the head permits still another form of spray, in the shape of an oblong strip four feet wide and from 40 to 50

THE BUCKNER SPRINKLER HEAD

THE SPRINKLER IN OPERATION

feet in length. This is of particular value in watering grass and flower borders.

A very complete sprinkling system has recently been installed by W. A. Buckner on the new golf course at Pebble Beach, Cal. This system is capable of distributing two million gallons per week. The piping alone cost more than $36,000. The Buckner No. 4 rotary sprinklers are used, mounted on pipes that screw into sockets placed along the edges of fairways and putting greens. Two dozen of these sprinklers, each with a sprinkling radius of 50 feet (100-foot diameter), constitute a unit. Two units are used in watering the course, and are moved alternately, from the first set of sockets to the third, and from the second to the fourth, and so on till the entire course is irrigated. The work is done at night, and in the daytime there is no visible trace of the system.

Cross-Country Hauling

A striking example of what good roads are making possible in the way of cross-country hauling is furnished by the Goodyear Company, which for several months has been operating a fleet of motor trucks between Akron and Boston, a round-trip distance of 1,540 miles. A five-ton Packard, the pioneer of the fleet, to date has traveled 30,000 miles over this route, having completed 19 round trips. A photograph of this truck is reproduced on page 419 of this issue.

With the exception of about 30 miles of very poor roads between Akron and Pittsburgh, the entire trip is over improved roads. From Pittsburgh to New York the trucks travel the Lincoln Highway, then over the Boston Post Road to destination.

Carrying a capacity load of rubber heels and soles, urgently needed by the shoe factories of Massachusetts, a giant Packard truck, newest addition to the fleet, recently clipped eleven hours from the schedule which has been established for this run.

The distance from the Rubber City to Boston is 740 miles. The Packard completed the journey in 77 hours elapsed time, 49 hours actual running time, at an average speed of 14.9 miles an hour for the entire trip.

Former Nurserymen Announce Services as Consulting Horticulturists

Louis A. Berckmans and P. J. A. Berckmans, Jr., recently of the P. J. Berckmans Company, Inc., Box 1070-L, Augusta, Ga., have retired from a long connection with the nursery business in its broadest aspects, and now offer their services as consulting horticulturists to all who need expert advice in relation to the cultivation and upkeep of orchards, private grounds and parks. They are prepared to discuss pruning, spraying, the control of plant diseases and kindred subjects from the standpoint of long and successful practice, and will provide expert men to carry out their recommendations and competently care for park trees and shrubbery as well as orchards and private estates.

Steam Shovels in City and County Work

Practically every county, city and municipality might add a good steam shovel to its standing equipment, and save considerable money digging new roads, repairing old ones, cutting sewer trenches, removing old macadam and leveling off unsightly piles of rock and dirt. With the right kind of a shovel—one that could be adapted for use on a wide range of jobs—the investment would certainly prove a highly profitable one.

The picture shows a road that has been cut thru and leveled off by a Thew shovel. This type of shovel is well adapted to work of this nature because of its horizontal crowding motion, which insures a clean, smooth, level cut, a floor held absolutely to whatever grade is desired, and a depth ranging from barely an inch to almost any normal requirement.

The operation of the Thew and its control begin with the dipper, which is suspended by an adjustable arm hinged to a trolley which

—yes, some twenty years ago

Twenty years ago, we made a big lot of Enameled Iron Street Signs for the City of Baltimore, but we haven't sold the City many since—only because

THE TOWN HASN'T NEEDED THEM

The signs we sold them twenty years ago are still doing business—that's the economy of "BALTO" Guaranteed Porcelain Enameled Iron Municipal Signs.

That's the proof that there is no "just-as-good."

If you can afford to experiment with low prices (?) you're fortunate, but the taxpayer pays the freight. Our product is the one absolutely dependable out-of-door municipal sign on the market, and we can prove it if given half a chance.

GIVE US THE CHANCE TODAY

Quotations and a sample of our finished product upon request—this involves no obligation on your part whatever.

May we send it to-day?

Write Dept. C.

THE BALTIMORE ENAMEL & NOVELTY CO.

Baltimore, Maryland, U. S. A.

WORK OF THEW SHOVEL IN CUTTING THRU AND LEVELING A ROAD

moves horizontally along a trackway. When power is applied, the dipper moves forward into the material, enabling it to be filled completely even in very shallow cuts. The action of the dipper is natural at every point of the stroke; the trackway is parallel to the grade, thus, obviously, assuring a far more level floor than would be possible were the crowding motion applied downward instead of forward.

Because of its special interchangeable features and its wide range of usefulness, the Thew has been aptly styled the "any job" shovel. It is manufactured in six sizes and sixty different combinations by The Thew Automatic Shovel Company, Lorain, Ohio.

by a donation from one of the large manufacturers of the city. The truck is an "Acme," made by the local firm, the Acme Motor Truck Company, and is geared to make a speed of 35 miles per hour. It is a combination hose and chemical, carrying 1,500 feet of hose, a 40-gallon chemical tank and other minor equipment, furnished by the American-LaFrance Fire Engine Company, of Elmira, N. Y. After careful investigation Dayton airless tires were chosen, and they have been found very satisfactory. The truck is equipped with dual rear tires, 38 x 5½ inches.

At the right on the seat is the Chief of the Fire Department, Thomas Maxwell. He

COMBINATION HOSE AND CHEMICAL TRUCK, CADILLAC, MICH.

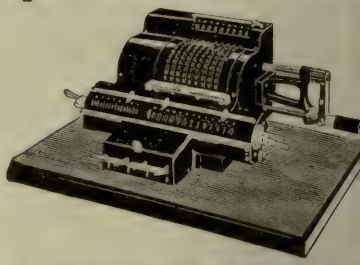
Fire-Reduction in Cadillac

Cadillac's Fire Department is the proud possessor of one of the finest fire trucks in Northern Michigan. Typical of a score of other city improvements this addition was made possible

started in with the fire-fighting squad thirty-one years ago as a volunteer in the first hand-cart brigade. As Chief for the last six years he is proud of the following statistics: 44 fires in 1912, 37 in 1913, 30 in 1914, 28 in 1915, and 24 in 1916.

City Officers—Auditors, Clerks, Engineers, Superintendents of Street

Do away with waste of time and the possibility of costly errors by using the



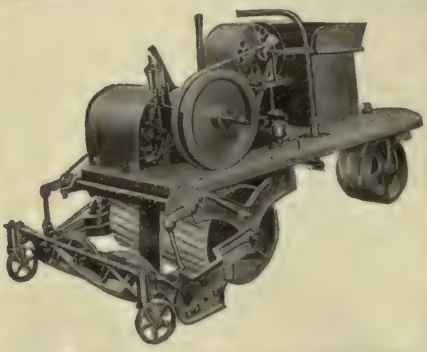
Marchant Calculator

The Marchant is used for

Tax extensions, checking footings, decreasing or increasing valuations, figuring fees, establishing levies, interest on county warrants, interest on tax delinquencies, bond and redemption interests, and in fact for all calculations.

MARCHANT CALCULATING MACHINE CO. Dep't L. **Emeryville, Oakland, Ca**

Eastern Representative, 465 Drexel Building, Philadelphia, Pa.



The Milbradt Power Lawn Mower

The Milbradt is a perfect power lawn mower. It will cut the grass close and clean, do it quickly and economically; a machine so simple in construction and operation that any one can handle it.

It cuts a swath 38 inches wide and has a speed twice the gait of a horse.

We will ship a mower on approval and guarantee same to be satisfactory in every respect.

Write for Circular Matter

MILBRADT MFG. CO. : St. Louis, Mo.

MOTT LAMP POSTS

STANDARDS OF MERIT

Special Designs of Lighting Standards For Type C Lamps

LAMP POSTS FOR ALL REQUIREMENTS

FOUNTAINS

Display and Drinking

For PUBLIC SQUARES, PARKS, PLAYGROUNDS, Etc.

ENTRANCE GATES, RAILINGS, SETEES

CATALOGUES ON APPLICATION

THE J. L. MOTT IRON WORKS

Fifth Avenue and 17th Street, New York

Do Expansion Joints Pay?

We have all seen brick pavements which, after a year or two of summer heat and winter frosts, have begun to buckle and weave. In most instances this failure is traceable either to the lack of expansion joints to take up the expansion and contraction of the pavement, or to poorly constructed "home-made" expansion joints. The two photographs shown on this page show clearly the possibilities of properly constructed pavements for long and satisfactory service. They were both taken from the same vantage point on Mount Vernon Place, Baltimore. As will be noted, one shows the pavement shortly after it was laid in 1912, and the other the same pavement in 1918. While undoubtedly much of the success of this pavement is due to careful construction, one of the important factors is the expansion joint installation.

BRICK PAVEMENT WITH ELASTITE EXPANSION JOINTS LAID IN MT. VERNON PLACE, BALTIMORE, 1912

THE SAME PAVEMENT AS IT APPEARS TO-DAY

The joints used in this pavement were made by the Philip Carey Company, 8 Wayne Avenue, Lockland, Cincinnati, Ohio, and are known as "Elastite" joints. They consist of a heavy body of special asphalt compound between two layers of high-grade asphalt felt. Experience has proved that they will not melt in summer nor become brittle and crack in winter. The joints adhere to the brick and retain their elasticity as long as the pavement itself endures. They have been used with success in many of the large cities of the United States and Canada, and the company stands ready at any time to demonstrate their practical economy and serviceability to any who may be interested in this "pavement insurance."

Secretary Chosen for Highway Industries Association

In the March issue of The American City attention was called to the organization of the Highway Industries Association, with headquarters at the Maryland building, Washington, D. C. An important announcement comes from the Washington office that H. G. Shirley, of Baltimore, Md., has been elected Secretary of the Association. For six years Mr. Shirley has been Chief Engineer of the Maryland State Road Commission, and for eight years previous to that was Engineer for Baltimore County. When the American Association of State Highway Officials was formed several years ago, Mr. Shirley was elected its first President. When the Highways Transport Committee was formed as a part of the Council of National Defense, Mr. Shirley was named as the member representing the state highway officials.

Waddell & Son Incorporated

The firm of Waddell & Son, with offices in Kansas City, Mo., and 35 Nassau Street, New York City, announces its incorporation. The new firm, Waddell & Son, Inc., includes, besides Dr. Waddell and N. Everett Waddell, their former assistant engineers, F. H. Frankland, Shortridge Hardesty and L. C. Lashmet. These five constitute the Board of Directors, the officers being J. A. L. Waddell, President; N. Everett Waddell, Vice-President, and L. C. Lashmet, Secretary and Treasurer. Mr. Frankland is Managing Engineer, Mr. Hardesty, Designing Engineer, and Mr. Lashmet, Office Engineer.

REGISTERED
THE MARK OF QUALITY — ECONOMY — IT PROTECTS THE USER
U. S. PAT. OFFICE

Drawing Tables and Filing cases in stock for immediate shipment.

Style No. 0, No. 1, No. 2
With tool tray and frame, and adjustable top.

ECONOMY TABLES MEAN ECONOMY IN EVERYTHING

Economy filing cases contain the most drawer space of any sections made.

Economy Dust Proof sections, for vault use, equipped with dust proof doors, keep tracings and blue prints free from dust, even when filed for years.

ECONOMY TABLES AND CASES ARE MADE IN WOOD OR STEEL

Write for Catalog

Economy Drawing Table Company

Adrian Michigan

Save Your Trees

Insects, worms and caterpillars can ruin trees in a season.

All worms and caterpillars are the young of insects—moths, etc. The females of many moths are wingless. They must climb the trunk to deposit eggs in the tree. Other species hatch in the ground and the larvae climb the trunk to feed on the leaves.

A protected tree trunk means absolute protection against Browntail, Tussock and Gypsy caterpillars, canker worms and many others, mitigating against tent caterpillars, codling moths, etc., etc.

INSECT-BAN

TREE TAPE

Absolutely bars all climbing pests

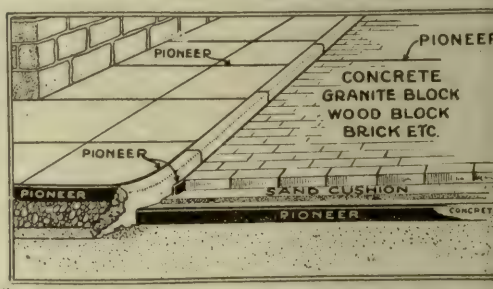
INSECT BAN is a tape in a protecting shield, saturated with a newly discovered powerful insect repellant. Cannot injure the tree. Harmless to birds or animals—but death to insects.

Shipped in rolls. User cuts to suit. Lasts whole season. Write for price, sample and booklet. Tells all about insects and worms, their habits, how to combat them, etc.

District managers and selling agents wanted

The Eggert Chemical Company

CANTON, OHIO



PIONEER ASPHALT JOINTS

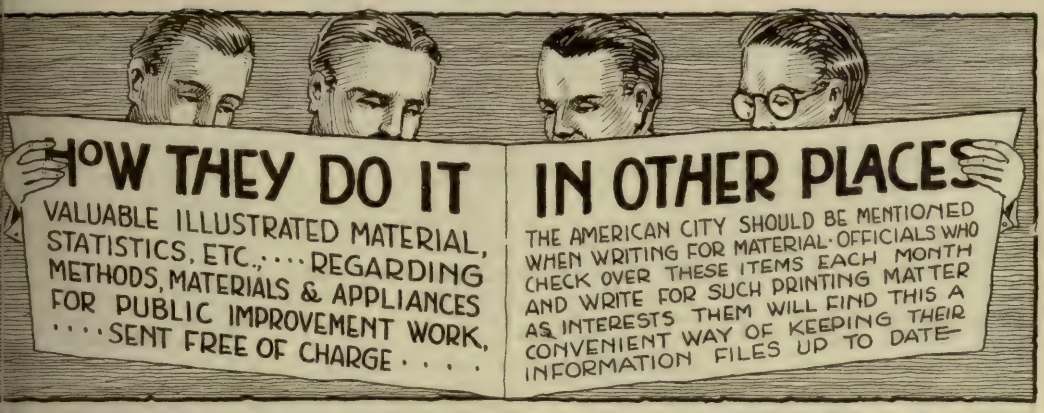
Pioneer Asphalt Expansion Joint is made of pure asphalt and comes to you in strips ready to lay. It is the standard joint used in connection with all concrete, block and brick pavements.

It has stood tests under the sunshine of summer, the cold of winter and the rains of spring—in every condition it gives perfect expansion—perfect service. Pioneer has a 20-year record of satisfactory service in over 300 cities.

Write us for sample joint and printed matter

THE PIONEER ASPHALT CO.
7323 Woodlawn Ave.
CHICAGO, ILL.

PIONEER Highest Quality ASPHALTS



Keep Accounts With a Calculator.
A leaflet describing "The Marchant Calculator" has been issued by the Marchant Calculating Machine Company, Department L, Emeryville, Oakland, Cal. This machine, which is specially adapted for municipal and county offices, does all the mechanical part of mathematics, at the same time insuring accuracy, and saves a very large proportion of the bookkeeper's time, which would otherwise be spent in purely mechanical operations. The company will be glad to furnish literature upon request.

Water-Works Economy and the Meter.
In a folder entitled "Waste," the Neptune Meter Company, 50 East Forty-second Street, New York City, preesnts Trident water meters as a means of eliminating water waste and the attendant needless expenses for fuel, labor and wear and tear on machinery. There is good food for thought in this folder for the water-works official in the unmetered or partly metered community.

Books on Paving, Road Maintenance, Sewers, Water-Works, Etc.
The catalog of John Wiley & Sons, Inc., 432 Fourth Avenue, New York City, will be of value to all those interested in books on the above subjects. On receipt of your request, John Wiley & Sons will be glad to place you on their mailing list to receive the "Wiley Reminder," which is distributed regularly as a means of announcement of the new books and revised editions which they are bringing out from time to time.

Chemicals for Water Purification
Public officials interested in this subject can secure prices and full information from the Pennsylvania Salt Manufacturing Company, Widener Building, Philadelphia, Pa., makers of sulphate of alumina, chloride of lime and liquid chlorine.

Attractive Nursery Offerings.
W. & T. Smith Co., Geneva Nursery, Geneva, N. Y., present in their revised general catalog a remarkable variety of nursery products for public and private property. A very convenient feature of the catalog is the section at the front given over to hints on transplanting, spraying and otherwise caring for trees and plants. Fruit and berry plants in profusion are described, as are ornamental and shade trees and flowering bushes.

Water-Works Appliances.
Water-works officials should have the catalog entitled "Sluice Gates and Other Water-Works Appliances," distributed by the Coldwell, Wilcox Company, Water Street, Newburgh, N. Y. This describes sluice gates and operating standards, valves, manhole frames and covers, screens for water purifications, flexible joints and other appurtenances for dams and water-works.

How About Your War Garden This Year?
If you haven't already started it, you can get a good line on late vegetables, among other things, in Dreer's Garden Book for 1918, which is a complete category of vegetables and flowers. Garden implements are also listed. The portion devoted to flowering shrubs and vines contains some hints which should prove interesting to park officials. Henry A. Dreer, 714-716 Chestnut Street, Philadelphia, Pa., will be glad to furnish the catalog upon request.

Your Concrete Floors Will Last Longer
if they are treated with Lapidolith, a liquid chemical hardener manufactured by L. Sonneborn Sons, Inc., Department 27, 264 Pearl Street, New York City. This product is in extensive use thruout the United States and abroad for dustproofing and wearproofing concrete floors in public buildings, such as schools, hospitals and municipal office buildings, and in factories, hotels and modern edifices equipped with concrete floors. Many of the larger buildings and plants which have Lapidolized their floors are shown in a pamphlet entitled "Lapidolith for All Concrete Floors," distributed by the company.

How Pure is Your Water?
The remarkable results in the purification of water following the installation of Pittsburgh filters are described in the catalog of the Pittsburgh Filter Manufacturing Company, Pittsburgh, Pa.

Road and Pavement Rollers.
Most cities and counties find it an important economy to purchase road rollers for the upkeep of their streets, and the catalog of the Buffalo-Springfield Roller Company, Springfield, Ohio is especially interesting in this connection.

Centrifugal Pumps.
The steadily increasing use of centrifugal pumps by municipalities for the pumping of water, sewage, etc., is frequently commented upon and the Centrifugal Pump catalog of the De Laval Steam Turbine Company, Trenton, N. J., will be of interest to all officials having to do with pumping problems.

The Proof of the Heater is in the Heating.
"The Littleford Line" is the title of a circular folder issued by Littleford Bros., 500 East Pearl Street, Cincinnati, Ohio. The folder presents tar and asphalt heaters, gravel driers, pouring pots for various purposes, and combination heaters and driers, with receptacles for pebbles and warming hoods for tar barrels and other large containers. These heaters have been used with great success for maintenance and repair work in large cities.

Steel Drafting Room Furniture.
Steel filing cases, drawing tables and stools are described in the catalog issued by the Economy Drawing Table Company, Toledo, Ohio. Attention is called to the care and expert workmanship that go into the construction of these products and to the fact that while the standard designs will in most cases meet all requirements, the company is prepared to build special furniture to suit individual taste.

Municipal Fire Alarm Systems.
A full line of equipment for modern fire alarm systems, from the street service boxes of the non-interfering and successive and the sector types to complete units of automatic, semi-automatic and manual fire alarm equipment for central offices, is presented in the catalog under the above title issued by The Gamewell Fire Alarm Telegraph Company, Newton Upper Falls, Mass. Gongs, steam and air sirens, diaphones and other alarm devices, as well as fire alarm box and terminal pedestals, storage batteries and battery racks, switchboards for large and small offices, repeaters, testing devices and numerous other fire alarm system accessories, are described in detail.

Continued on page 71

Medart Playground Apparatus

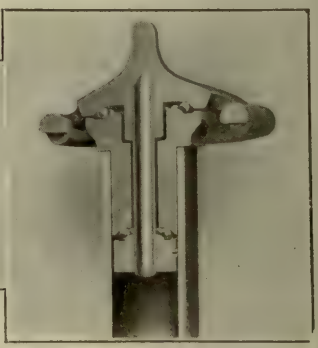
THE CONSTRUCTION DETAILS, which have made **MEDART PLAYGROUND APPARATUS** a recognized standard for safety and durability, are fully illustrated and described in our catalog "W".

MEDART QUALITY, combined with a thorough system of inspection, is assurance against occasional breakage and numerous repair bills.

WRITE FOR CATALOG "W". It explains all construction details.

FRED MEDART MFG. CO., St. Louis, Mo.

Gymnasium Apparatus—Steel Lockers



ALL MUNICIPALITIES NEED PLAYGROUNDS

The Playground not only betters the physical and moral tone of a city, but it is a real live investment. It cuts the perpetual moving population to a minimum which saves your manufacturer and your merchant.

American Apparatus will produce results.

WRITE FOR OUR CATALOGUE TO-DAY

AMERICAN PLAYGROUND DEVICE CO., W. 25th St., Anderson, Ind.

Valuable illustrated material, catalogs, statistics, etc., as mentioned below, relative to methods, materials and appliances for public improvement work, will be sent free of charge if you mention THE AMERICAN CITY. See page 69.

A New Book on Pipe.

A book containing photographs of interest to all users of pipe has just been published by The Central Foundry Company, 90 West Street, New York City. This book, entitled "Universal Pipe for Every Service," illustrates many of the severe and unusual services this pipe has been called upon to perform. The labor-saving features of the Universal joint and the elimination of installation equipment by its use are described in detail. A copy can be secured upon request to the New York Office of the company.

Lay the Joints First.

This is the title of the last monthly calendar card distributed by the Philip Carey Company, 8 Wayne Avenue, Lockland, Cincinnati, Ohio. Any city official interested in the proper laying of pavements and sidewalks will find it worth while to send his address to the Carey Company, in order that his name may be placed on the list without charge to receive these calendar cards each month. They contain interesting suggestions relative to avoiding cracking and buckling in pavements and sidewalks.

Save Your Trees from Insects.

Trees may be ruined in a single season by insects, worms and caterpillars. Are your tree trunks protected" If not, you may be interested in securing information from the Eggert Chemical Company, Canton, Ohio, regarding its Insect-Ban, Tree-Tape, which is easy to apply, and will protect your trees in an effective manner.

Advantages of Brick Roads and Pavements.

Illustrated booklets on this subject are being distributed by the National Paving Brick Manufacturers' Association, 831 Engineers' Bldg., Cleveland, Ohio.

Valves and Hydrants.

The catalog of the Flower-Stephens Manufacturing Company, 103 Parkinson Street, Detroit, Mich., will be of interest to all water-works and municipal officials who are considering purchases along this line.

Municipal Power Plants.

City officials who are considering the erection or extension of water-works or lighting plants will be interested in the literature of the Scofield Engineering Company, of Philadelphia, Pa., which specializes on the construction of plants of this character.

Sewage Disposal Apparatus.

The Sanitation Corporation, 50 Church Street, New York City, is distributing literature regarding the various kinds of sewage disposal machinery which it furnishes. Any municipality having problems in the sewage-disposal line will find it worth while to communicate with this company.

Is Your Water Filtered?

If you have not already installed a satisfactory filtration plant, the booklet of the Norwood Engineering Company, Florence, Mass., will be of interest to you.

Mathews Fire Hydrants.

A catalog relative to this well-known make of fire hydrants can be secured from R. D. Wood & Company, Philadelphia, Pa., who also have catalogs on gate valves, cast iron pipe and other water-works fittings.

Street Signs and Traffic Signs.

The Union Iron Products Company, Drawer H-2, East Chicago, Ind., offers in its 1918 catalog street, traffic and warning signs of heavy-gauge metal constructed to withstand rough treatment. Attention is directed to the elastic iron paint coatings, countersunken letters and simplicity of design which make these signs attractive and easily legible.

Sanitary Catch Basin Cleaning.

A folder regarding the performance of the Otterson Auto-Eductor has been prepared by the Otterson Auto-Eductor Company, 817 Fairbanks Building, Springfield, Ohio. The Auto-Eductor, it may be explained, represents the latest development in the economical and sanitary cleaning of catch basins by machinery. It consists of a specially designed auto truck with a pumping attachment whereby the sewage is drawn up by suction directly from the basin into the truck, and the excess water is released and returned to the sewer.

Water Meters a Big Asset.

Any municipality where the water services are not already fully metered will find some interesting points on water-waste prevention in the catalog of the Union Water Meter Company, Worcester, Mass.

Meter Boxes and Manhole Tops.

are described in the illustrated printed matter of the S. E. T. Valve Meter Company, 50 Church Street, New York City. The Jersey Meter Box is made in all sizes up to 36 inches, and the S. E. T. manhole top is non-rattling and instantly adjusted to the street level.

Lighting Standards and Drinking Fountains.

A variety of attractive designs are illustrated in the catalog of the Chicago Concrete Post Company, 608 Dearborn Street, Chicago, Ill., Other specialties of this company are park benches, flower urns and sun dials suitable for parks or private places.

Parks, Private Estates and War Gardens.

Trees, shrubs and flowers of every description are brought to the attention of plant lovers in an attractive catalog prepared for this season's trade by the American Nursery Company, Singer Building, New York City. Prices are given on all varieties of deciduous and evergreen trees, and many of the more popular flowering shrubs are shown. In the rear of the catalog a splendid variety of fruit trees and berry bushes are offered.

Sewage Treatment Literature.

A pamphlet of unusual interest to all those who are concerned with sewage-treatment problems has been published by the General Filtration Company, Inc., Cutler Building, Rochester, N. Y., under the title "The Activated Sludge Process of Sewage Treatment," by J. Edward Porter, Chemical Engineer of the General Filtration Company. It contains brief abstracts, patents, news items, and other information compiled from current literature.

Studebaker Road Oilers.

Catalog No. 108, issued by the Studebaker Corporation, South Bend, Ind., describes in detail the operation of the Studebaker road oiler. A full-page phantom illustration brings out all the noteworthy operating features. The gearing, tank, oil strainers, heating apparatus, pump, distributing device, nozzles and extra equipment are successively treated in detail. An interesting page of photographs shows many novel means of operating the pump by which the tank is filled.

Suggestions for Beautifying Home Grounds.

A catalog entitled "Trees, Flowers, Fruits," issued by the Hicks Nurseries, Westbury, Long Island, N. Y., illustrates in an appealing way the possibilities of flowers, evergreens, shrubs and deciduous trees for beautifying and lending character and seclusion to small estates, as well as large. Prices are quoted on a great variety of plants and trees, and attention is called to the guarantee, under the terms of which all unsatisfactory plants will be replaced, regardless of whether or not the employes of the nursery planted them.

EVERYTHING for the PLAYGROUND

PROGRESSIVE CITIES EQUIP THEIR PLAYGROUNDS WITH

THE FUN-FUL LINE
PLAYGROUND EQUIPMENT

In use in scores of cities all over the country.

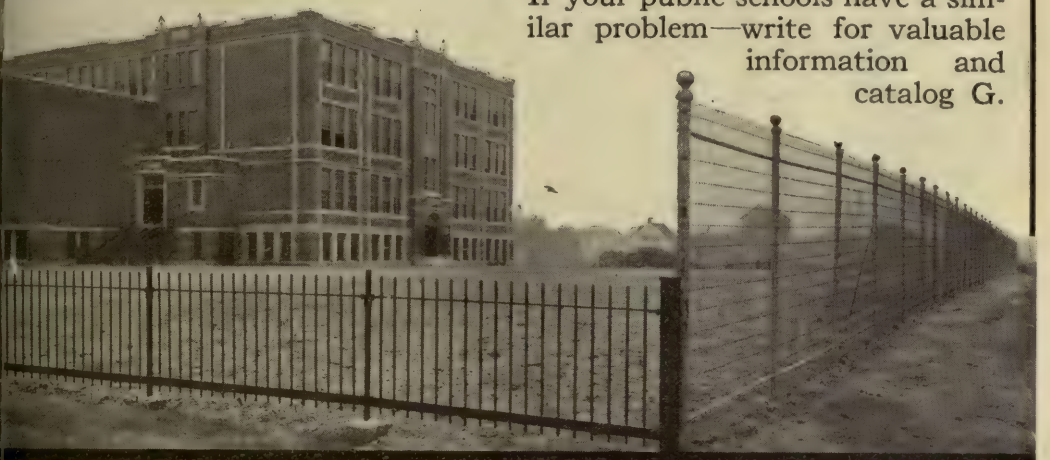
Fun-Ful Apparatus is safe, modern, durable and economical.

Write for illustrated catalog

HILL-STANDARD CO.

216 FUN-FUL AVENUE
ANDERSON, IND.

An important problem was solved for this public school when an Excelsior Rust Proof Fence and an Excelsior Iron Fence were erected. If your public schools have a similar problem—write for valuable information and catalog G.



WRIGHT WIRE CO.
WORCESTER, MASS.

All Steel Playground Apparatus

THE EUREKA LINE

THE EUREKA STUDEBAKER PARK COMBINATION

Swings, Giant Strides, Flying and Traveling Rings, Teeter Boards and Ladders, Aluminum and Maple Slides, Park Settees and Lawn Swings, Merry-Go-Rounds, Horizontal Ladders and Combinations.

Cat. No. 16 Full Outfits And Fittings Only

The Ashland Mfg. Company
Dept. 14 Ashland, Ohio

To so form the life of our youth that they need never be reformed is indeed a great achievement

Eureka Equipment Utility Unexcelled Renowned Rectitude Efficient Economical Kiddies Kind All-Steel Apparatus

NOVALUX

"NOVALUX LIGHTED" is only another way of saying *"progressive city."* Even the small towns that are Novalux lighted are a pride to their states.

Where there is Novalux lighting you will usually find everything else also modern—good paving, good sanitation, good schools, upstanding police and fire departments, inviting residential streets and a thriving business section.

City welfare is not a thing to be neglected in time of war. No dollar of public moneys that is intelligently expended in the interests of public safety and welfare is a slacker dollar.

The value of modern street lighting to a town is too well known to need explanation here. But the economies of Novalux lighting are of real moment in these days when everybody should count the cost.

For small town and metropolis—for lonely highway and principal thoroughfare—for residential and industrial sections—there are now exactly the right Novalux street lighting units to provide scientifically correct illumination most economically.

The economies of the Novalux light source—the MAZDA C Lamp—are well known to you. In addition to these are the Novalux economies of reflection and refraction—the art of utilizing *all* the light.

When you need street lighting counsel you will make no mistake by consulting the Street Lighting Specialists of a Company that has had a quarter-century experience in making everything from generator to lamp.

GENERAL ELECTRIC CO.
SCHENECTADY, N.Y.

Sales Offices in Principal Cities

35-3

GENERAL ELECTRIC COMPAN

A Call to Men Who Can Lead

Have you ever considered the big opportunities the Chamber of Commerce field offers to men who can demonstrate their ability to lead?

There are good salaries and steady ad-ncement waiting for men who can make od as Chamber of Commerce secretaries— the field is growing rapidly.

This work in itself is fascinating—full opportunity for accomplishment, con-uctive, continually changing, always w. The element of monotony is almost ver present. The secretary is always at e forefront of his community's advance.

It is stimulating because the Chamber of mmerce secretary is continually in con-ct with the strongest brains in the com-unity.

It offers the man who cannot go "over ere" an opportunity to serve his country fectively "over here." The modern hamber of Commerce provides the best-oved means of organizing the human powers of a community to meet the issues the war has created.

The most satisfactory means of securing a foothold in this field is offered by the A. C. B. Summer School for Commercial Organization Secretaries. Why not attend this year—and make the time you have already given to Chamber of Commerce work pay dividends?

Eagles Mere Park, Pa., where the school will be held, is a place of unusual attractiveness. It provides an opportunity to combine a pleasant vacation and physical revitalization with mental preparation for larger opportunities.

There is more about this School in a pamphlet just issued—"A Call to Men Who Can Lead." You can get a copy by signing this blank and mailing it back to us. Why not do this, at any rate?

American City Bureau
Tribune Building, New York

Date.....

GENTLEMEN:—

Send me your pamphlet "A Call to Men Who Can Lead." I would like to know more about the A. C. B. Summer School.

Signed.....

Address.....

Cemcoat

The Enamel-like Wall Coating

Cemcoat is furnished in either Gloss or Flat.
Cemcoat has the combined virtues of enamel and paint.
It presents a tile-like finish.
It is washable, sanitary and durable.
Cemcoat should be used for all municipal buildings such as Schools, Bath Houses, Police Stations, Jails, etc.
Particularly adapted for safety lines on pavements.

Write for literature, color card, testimonials, etc.

Department 27

L. SONNEBORN SONS, Inc.
264 Pearl Street, New York

SANITARY DRINKING FOUNTAINS

LIPS CANNOT TOUCH IT
WASTE WATER FROM MOUTH CANNOT RETURN TO THE BUBBLER
Ideal for Parks and Schools
Write for free Booklet
PURO SANITARY DRINKING FOUNTAIN CO.
125 Main St., Haydenville, Mass.

FOUNTAINS
DISPLAY and DRINKING
LAMP STANDARDS
OVER ONE THOUSAND PATTERNS
THE CASEY HEDGES CO.
CHATTANOOGA, TENN.
Chicago **Cincinnati**

LAPIDOLITH

TRADE MARK

For All Concrete Floors

The concrete floors in your water-works, fire-houses, filtration plants, pump stations, etc. need Lapidolith to make them hard as granite—dustproof, waterproof and resistant to the action of most chemicals. Lapidolith should be used on all concrete floors, old or new. Results are guaranteed.

Used by leading industrial plants in every line in every city.

Write for literature, testimonials and free samples.

Department 27

L. SONNEBORN SONS, Inc.

264 Pearl Street, New York

Expert Advice and Service *for* Park Departments

Do you know what your costs are?
Do you know whether you are getting value for your money?
Would you like system and business method put into effect?
Let me tell you how to do this and get the most out of your park system.
This is a real service by expert and skilled persons.
We will put business methods into park maintenance and development. We will show you how to save money and get increased results.

Write for Detailed Information

Benjamin E. Gage

30 N. La Salle St. Chicago, Ill.

Every Official and Engineer *SHOULD HAVE OUR CATALOGS*

We are always glad to send to city and town officials and engineers copies of our catalogs describing

SPRACO

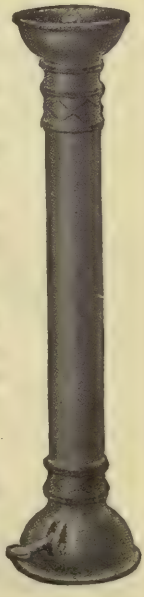
systems for aerating water, washing air, sprinkling parks and gardens, applying bituminous road binders, and for cooling condensing water for power plants.

Write today for the catalog in which you are likely to be interested.

SPRAY ENGINEERING COMPANY

93 Federal Street, Boston, Mass.

INEXPENSIVE DRINKING FOUNTAINS



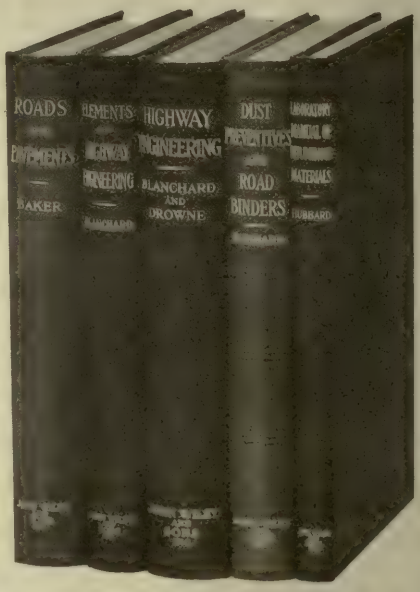
Our bubbling fountains, the practical kind, are just the kind to be installed on your streets and boulevards, in your parks and squares and public playgrounds. The expense for installation is very small as is the upkeep cost.

We are specialists on fountains for drinking purposes. Place your requirements in our hands. Write for our catalogue showing our many designs.

RUNDLE-SPENCE MFG. CO.

Milwaukee, Wis.

WILEY BOOKS FOR HIGHWAY ENGINEERS



A Treatise on Roads and Pavements

By Ira Osborn Baker, C. E., D. Eng'g, Professor of Civil Engineering, University of Illinois. Third Edition, Rewritten and Enlarged.

Radically revised to conform to the numerous changes in methods of road and pavement construction. Five new chapters on important subjects have been added; and road designers and inspectors will find it a valuable work for constant reference.

xi + 666 pages. 6 by 9. 235 figures, 80 tables. Cloth, $5.00 net.

Elements of Highway Engineering

By Arthur H. Blanchard, C. E., A. M., Professor in charge of the Graduate Course in Highway Engineering in Columbia University.

Emphasizes the fundamental principles evolved from past experience as well as from the modern practice of highway engineering.

xii + 514 pages. 6 by 9. 302 figures. Cloth, $3.00 net.

Highway Engineering

By Arthur H. Blanchard, C. E., A. M., and Henry B. Drowne, C. E., Instructor in Highway Engineering in Columbia University. Total Issue, 5,000.

Engineers actively engaged in highway engineering work will find this a comprehensive book. All phases of the subject of modern highway engineering are treated.

xiii + 762 pages. 6 by 9. 234 figures. Cloth, $4.50 net.

Dust Preventives and Road Binders

By Prévost Hubbard, Chief, Division of Road Material Tests and Research, U. S. Department of Agriculture.

Furnishes road engineers with a working knowledge of the characteristic properties of dust preventives and road binders.

vii + 416 pages. 6 by 9. 51 figures. Cloth, $3.00 net.

Laboratory Manual of Bituminous Materials

For the Use of Students in Highway Engineering. By Prévost Hubbard, Chemical Engineer.

Highway engineers in charge of State, county, or municipal work who have, or expect to have, a laboratory at their disposal, will welcome this book. It also fills a want upon the part of instructors and students.

xi + 153 pages. 6 by 9. 39 figures. Cloth, $1.50 net.

10 DAYS FREE EXAMINATION

John Wiley & Sons, Inc., 432 Fourth Ave., N. Y. City.

Gentlemen:—Kindly send me for 10 days free examination the following books:

.....

.....

.....

It is understood that I am to remit the price of these books, or return them, carriage charges prepaid, within 10 days after their receipt.

Name.....

Address.....

(Indicate on the line above if you are a subscriber to American City; or give the name of the engineering society of which you are a member. If you are not a member of any society, kindly give a reference or state your position.) AC 5-18

Free Examination — No Cash In Advance

You can examine these books for 10 days, without sending cash in advance. This privilege is extended to subscribers to *American City*, or to members of any National engineering society. If you are not a subscriber or a member of any society, you can supply a reference, or indicate your position.

JOHN WILEY & SONS, Inc.

432 Fourth Avenue, New York

London: CHAPMAN & HALL, Ltd.

Montreal, Canada Renouf Publishing Co.

Manila, P. I. Philippine Education Co.

FIBREX TREE WIRE

FIBREX TREE WIRE is a rubber insulated, copper conductor, protected by a serving of tarred jute, one non-metallic tape and a weatherproof braid such as is applied to Simplex Wires and Cables for out-door service. The total thickness of this protection is about 5-32″.

FIBREX TREE WIRE is distinguished by a treated fibrous tape which is exceedingly tough and resists wear far better than any non-metallic protection previously applied to tree wires. This tape is applied in the same manner as steel tape and does not interfere with the flexibility of the insulated wire. It has the advantages of steel tape without its disadvantages.

FIBREX TREE WIRE is absolutely non-inductive. It is not a menace to workmen on or near the lines, because the fibrous tape can carry no dynamic or static charge.

FIBREX TREE WIRE will often save the expense of tree trimming. Tree insulators or battens are unnecessary.

FIBREX TREE WIRE is less expensive than some of the protective devices ordinarily used. It can be jointed to the line wire easily and safely.

FIBREX TREE WIRE is weatherproof. Regardless of weather conditions, grounds do not occur with their consequent dangers. There is no leakage over the fibrous tape and a uniform line voltage is preserved.

FIBREX TREE WIRE is made for all commercial voltages.

Ask for Sample and Prices.

SIMPLEX WIRE & CABLE Co

MANUFACTURERS

201 DEVONSHIRE ST. BOSTON

CHICAGO SAN FRANCISCO

PLAYGROUND BOOKS

Folk Dance and Game Books For Schools and Playgrounds

The plays, dances and games described in these books furnish wholesome and beneficial exercise as well as pleasure and recreation for growing children.

Bear in mind that the days at school are the "foundation" days. Help the children to lay a good, strong and sturdy one—in mind and body.

Look over this list of books—any one or all will be sent on approval.

Send for circular giving Table of Contents of each book.

Write now while on your mind.

The Song Play Book. Wollaston and Crampton	$1.80
The Second Folk Dance Book. Crampton	1.80
The Playground Book. Sperling	2.00
More Song Games. Bremmer	1.60
Aesthetic Dancing. Rath	1.60
Dramatic Games and Dances. Crawford	1.80
The Festival Book. Lincoln	1.60
The Folk Dance Book. Crampton	1.80
Swedish Folk Dances. Bargnquist	1.60
Folk Dances and Games. Crawford	1.80
Plays and Games for Indoors and Out. Parsons	1.60
Graded Games and Rhythmic Exercises. Newton	1.40
Song Games and Ball Games. Bremner	1.40
Play Songs. Bentley	1.60
Rhythms of Childhood. Crawford	1.80

The A. S. Barnes Co. - 381 Fourth Ave. - New York

400 Baths
600 Rooms

The House of Taylor

HOTEL MARTINIQUE

Broadway, 32d St.
NEW YORK, N.Y.

One Block from Pennsylvania Station.

Equally Convenient for Amusements, Shopping or Business

Pleasant Rooms, with Private Bath, **$2.50** per day

257 Excellent Rooms, with Private Bath, facing street, southern exposure, **$3.00** per day

Also Attractive Rooms from $1.50.
The Restaurant Prices Are Most Moderate

Every Municipal Engineer
who is at all interested in
Buying or Selling

Rails, Cars
Locomotives
Machinery, Steel Piling
Tanks, Wire Rope, etc.

should get *Bulletin 237*
70 pages *Good Stuff*

ZELNICKER IN ST. LOUIS

FLAG STAFFS

FOR
PUBLIC SQUARES,
SCHOOLS, LIBRARIES,
CITY HALLS, & COURT HOUSES.

Barnum staffs are made of steel tubing, which is far superior in strength, appearance and durability to the old fashioned wooden poles. No guy wires or other braces necessary. Made in heights from 20 ft. to 100 ft.

If your town contemplates erecting a flag staff, let us prepare specifications and submit proposals without obligation to you.

E. T. BARNUM, WIRE AND IRON WORK
864-878 Woodward Ave., DETROIT, MICH.

A New Volume of Great Value to City Officers and All Who Have the Welfare of Their Municipality at Heart

A NEW MUNICIPAL PROGRAM

Edited by Clinton Rogers Woodruff

The latest thought on civic government
By the best thinkers of the day
Each chapter written by an expert

This book offers a complete and practical program of municipal reform as it has been found efficient in various cities of the United States. Each phase of city government is taken up in a separate chapter, written by a man who has devoted years to the study and investigation of his special problem. The book covers in detail the model city charter, administrative organization, city planning, the franchise policy, the council, business management for city courts, municipal home rule, the short ballot principle, etc. Among the contributors are such prominent men as President Lowell of Harvard, William Dudley Foulke, Delos F. Wilcox, Richard S. Childs, William Bennett Munro, Herman G. James, John A. Fairlie, F. W. Breimeier, Mayo Fesler, M. N. Baker, and Herbert Harley.

National Municipal League Series. 12mo. Cloth. $2.00 net.

Other Volumes in the National Municipal League Series

Edited by Clinton Rogers Woodruff.

City Planning
Edited by John Nolen.
Town Planning For Small Communities
Edited by Charles S. Bird, Jr.
The City Manager
By Harry Aubrey Toulmin, Jr.
City Government by Commission
Edited by Clinton Rogers Woodruff.
Municipal Functions
By Herman G. James.
Satellite Cities
By Graham Romeyn Taylor.
The Regulation of Municipal Utilities
Edited by Clyde L. King.
Excess Condemnation
By R. E. Cushman.
The Social Center
By Edward J. Ward.
Lower Living Costs in Cities
By Clyde Lyndon King.
Woman's Work in Municipalities
By Mary Ritter Beard.
The Initiative, Referendum and Recall
Edited by William Bennett Munro.

Uniform Binding. 12mo. Cloth $2.00 net per volume. By mail, $2.15.

These Are Appleton Books. At All Booksellers.

D. APPLETON AND COMPANY

PUBLISHERS 35 W. 32nd Street NEW YORK

The Noiseless Typewriter

Increases productive power by giving the mind a fair chance.

Hence at a time of world crisis it is the helpful servant of those who with intense effort are bending their energy to accomplish great results.

Readers of this Magazine will be interested to learn that the Noiseless Typewriter is used exclusively in the office of the American City.

Send for literature and an impressive list of users; or better still, ask for a demonstration and test at your own office.

The Noiseless Typewriter Company

253 BROADWAY, NEW YORK

Other Offices in

CHICAGO
PHILADELPHIA
BOSTON
DETROIT
CLEVELAND
SAN FRANCISCO
LOS ANGELES
and MONTREAL

BENCHES AND SWINGS

for

Parks and Playgrounds

MADE IN ALL GRADES, STYLES AND SIZES

Write for Illustrated Material

NOLL BROTHERS, MFRS.

Bausman, Lancaster Co. Penn.

REFUSE GOES INTO THE CAN— NOT INTO THE STREET

Why doesn't your city place Rochester cans on the street corners, in the parks and in all other convenient places. Rochester cans do away with unsightly littered streets. All rubbish goes into the cans — not into the gutters.

Made of the best materials and in many styles. Made by the makers of the famous "Iron Horse Brand" ash, garbage, street and trash cans.

Reasonable prices. Immediate shipments.

Send for illustrated catalog.

ROCHESTER CAN CO.

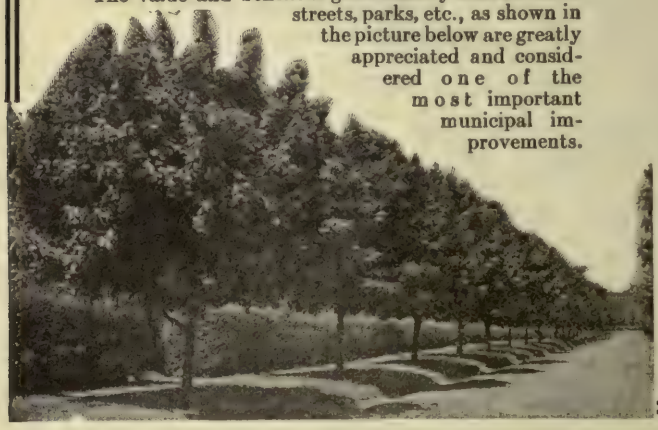
ROCHESTER, N. Y.

Shade Delivered With The Trees

3 to 5 years or more according to size saved over small saplings. We take the risk during their early tender life and you get the benefit.

We guarantee good trees of substantial growth and will replace any one that fails to thrive. We could not afford to make this offer if we did not know the good roots of trees that we furnish.

The value and benefit of good healthy shade trees in streets, parks, etc., as shown in the picture below are greatly appreciated and considered one of the most important municipal improvements.



Don't leave your streets barren and uninviting like the above. With a small outlay of money make your city attractive and a desirable place to live in.

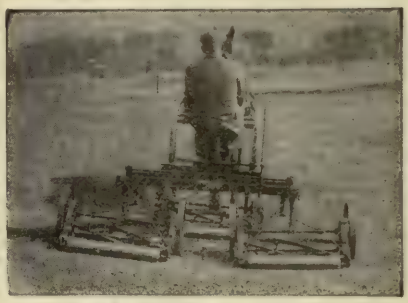
Write today for literature on the subject.

Remember Hick's Trees are tall, straight and bushy and our 65 years in the business is a guarantee of quality.

HICKS NURSERIES

Westbury Long Island

UNIVERSALLY ADOPTED



THE SHAWNEE TRIPLE

"The Spring's the Thing"

SHAWNEE MOWER CO., 5 Beekman St., N. Y.

Butler Refuse Cans

are neat cans

The collected refuse in Butler Cans doesn't show up before your eyes.

It is covered from view (see illustration). These cans are shipped "knock-down" thus saving big freight bills. Write for particulars.

The Butler Mfg. Co.
St. Anthony Falls Sta.
Minneapolis, Minn.

Also makers of "Rus-Pruf" corrugated culverts with B.M.C. Wings

STEWART IRON FENCE

"The Standard of the World"

beautifies and protects public propert
economically, permanently, satisfactoril
The fencing of reservoirs at Chattanooga, Ten
Fort Thomas, Ky., Butte, Mont., and pumpi
stations at New York City and Seattle, Wash., a
typical Stewart installations.
Stewart's Iron Fence and Gates for hospitals, schoo
parks, playgrounds and public buildings. Wri
for big illustrated catalog.

THE STEWART IRON WORKS CO.
(Incorporated)
527 Stewart Block Cincinnati, (

Thorburn's

1917 Catalog

A very large volume of Thorburn Seeds are furnished for parks and cemeteries.

Write us for catalog and let us know your requirements: and your letter will have our prompt and careful attention.

J. M. Thorburn & Co.
53 Barclay Street NEW YORK

MEEHAN
Nursery Stock
Needs no recommendation. It is known throughout the American Continent

225 acres

ORNAMENTAL TREES, SHRUBS, EVERGREENS and HARDY PLANTS

Spring catalog now ready

THOMAS B. MEEHAN CO.
Wholesale Nurseryman
DRESHER (Near Philadelphia) PA.

Burpee's Seeds Grow

BURPEE'S ANNUAL for 1918, the Leading American Seed Catalog contains the latest and most reliable information about "The Best Seeds that Grow." 216 pages with 103 colored illustrations. It is sent free to those who write for it. Write for your copy today. A post card will do.

W. ATLEE BURPEE & CO. Seed Growers PHILADELPHIA

Nurserymen, Florists and Seedsmen

Everything for Parks, Cemeteries and Private Places. Largest general assortment in America. Personal inspection invited. Special prices on car load lots. Switch from New York Central Ry. to our grounds. 1200 acres. Pleased to quote on your want list.

THE STORRS & HARRISON CO.

Landscape Dept.
627 Engineers Bldg.,
Cleveland, Ohio

Painesville,
Ohio

NORWAY MAPLES

The best shade tree for street and park purposes — especially in northern latitudes and in smoky and dusty localities — is the Norway Maple.

Norway Maples such as the one depicted transplant with the minimum of setback and give immediate effect. We have several thousand trees just as good as this one. Many are better.

All are sound, healthy trees with straight, smooth, sturdy trunks, heavy masses of fibrous roots, and well-developed, bushy heads. They run 14 to 16 feet tall and in two calipers — 2 to 2½ inches and 2½ to 3 inches.

Trees of this size pack about 500 to 700 to the carload. Write us for prices on the quantity you can use. Special prices on carload lots.

We also grow a general line of trees, shrubs and evergreens for street and park planting.

Framingham Nurseries
FRAMINGHAM — MASSACHUSETTS

Willadean Nurseries

Offer a very complete line of Trees, Shrubs and Ornamental stock for all kinds of Landscape work. Send your want lists for estimate. Trade list on application.

THE DONALDSON CO.
Box 22, SPARTA, KY.

TREES SHRUBS EVERGREENS

800 ACRES

AMERICAN NURSERY CO.
Singer Building, New York
NURSERIES
Springfield, N. J. Flushing, L. I.

BOBBINK & ATKINS

World's Choicest Nursery and Greenhouse Products

We invite interested parties to visit our Nursery and inspect our Trees, Shrubs, Evergreens, Herbaceous Plants, Roses and other stock of which we have more than 300 acres.

OUR ILLUSTRATED GENERAL CATALOG No. 22 describes the high class Nursery material we grow.

SPECIAL PRICES quoted on lists for Public Parks.

Nurserymen, Florists and Planters, Rutherford, New Jersey

W. & T. SMITH COMPANY

NURSERY STOCK AT WHOLESALE

Send for Catalogue and Price List

GENEVA NURSERY, Geneva, N. Y.

Lewis & Valentine Co.
Roslyn, N. Y.
The World's Largest Movers of Big Trees.

Ornamental Trees, Shrubs, and Hardy Perennials

A complete stock.
Quality unexcelled.
Send for price list.

HENRY KOHANKIE & SON
Painesville, Ohio

Norway Maples

are unrivalled for shade and for landscape effects. We have a large stock of splendid specimens that will mature rapidly into towering round-topped trees, with clean, sturdy trunks. Also a complete stock of ornamentals. Over 2500 acres in nursery stock.

Write for 1918 Catalog and prices.

Harrisons' Nurseries, BOX 70, Berlin, Md.

Dreer Specialties

Decorative Plants, Roses, Hardy Perennials, Hardy Shrubs, Hardy Climbers, Box Woods and Bay Trees, Hedge Plants, Aquatics, etc. We are large producers of above and many other plants suitable for Park use.

Write for Catalogue.

HENRY A. DREER, Philadelphia, Pa.

FOR *SAFE* TREE SURGERY—

for Tree Surgery that is scientifically accurate and mechanically perfect—for Tree Surgery that saves trees without guessing and experimenting—come to headquarters.

The Davey Tree Expert Co., Elm St., Kent, Ohio

Branch offices with telephone connections: 225 Fifth Ave., New York. 2017 Land Title Bldg., Philadelphia. 450 McCormick Bldg., Chicago.

Permanent representatives in all principal cities.

Davey Tree Surgeons

ENTERPRISE PROTECTIVE FENCE

protects and beautifies

Keeps out undesirable persons. Beautifies surroundings and increases values. Does not obstruct fine views.

Schools
Hospitals
Parks
Estates
Public Bldgs.
Cemeteries
Asylums
Etc., Etc.

Send for Illustrated Catalog explaining offer to make free blue-print of Enterprise fencing for any property.

ENTERPRISE IRON WORKS 1161 E. 24th St., Indianapolis

Specialists for 33 years in All-Iron and Iron-and-Woven-Wire protective fencing

AMERICAN-GROWN TREES

OUR stocks of trees, shrubs and plants are not curtailed by the stoppage of foreign shipments. We sell Andorra-grown.

Catalog on request.

ANDORRA NURSERIES Wm. Warner Harper, Prop.

Box 20, Chestnut Hill, Phila., Penna.

Bound Volumes of THE AMERICAN CITY

A set of bound volumes of THE AMERICAN CITY makes a most valuable reference work for municipal offices, public libraries, etc., and we are in a position to supply all volumes from Volume I to Volume XII, inclusive. The prices of the volumes vary somewhat on account of the scarcity of some of the issues contained. We will be glad to quote terms on application.

THE AMERICAN CITY, 154 Nassau Street, NEW YORK CITY

ODORLESS STAINLESS

DUSTOLINE FOR ROADS

TRACKLESS (TRADE MARK) TRANSPARENT

THE DUSTOLINE FOR ROADS CO., Summit, N. J., Phone 33

Has none of the objectionable features of the black asphaltic oils or tar preparations

City Planning in Flesh and Blood

If you are interested in planning for the future of your city in terms of better health, less poverty, better education, more wholesome recreation, happier and more contented workers, closer cooperation between public and private welfare agencies;

If you want to keep in touch with the most authentic news and the most authoritative opinion from every field of work for the common welfare;

You will find enjoyable, helpful and inspiring the attractively printed, graphically illustrated and carefully edited weekly issues of **The Survey.**

Send three dollars now in check or greenbacks for a year's subscription—52 issues.

THE SURVEY

JOURNAL OF SOCIAL WORK.

112 East 19 St. Room 1204 New York City

Paul U. Kellogg, Editor.

Edward T. Devine, Graham Taylor, Jane Addams, Associate Editors

Expert Advice is a Real Economy

DIRECTORY OF CONSULTING ENGINEERS CONTRACTORS LANDSCAPE ARCHITECTS

Effective Construction Requires Wise Planning

Albright & Mebus
CIVIL ENGINEERS
Town planning and municipal improvements, parks, drainage, sewerage and sewage disposal.
908 LAND TITLE BUILDING
PHILADELPHIA

KANSAS CITY, MO. Interstate Bldg.
Burns & McDonnell
CONSULTING ENGINEERS
Appraisals, Rate Investigations, Expert Testimony, Water Works, Sewerage, Lighting.
Clinton S. Burns R. E. McDonnell

Analyses Tests Inspections
Consultations Reports Specifications
WALTER H. FLOOD
Chemical Engineer
PAVING AND ENGINEERING MATERIALS
Municipal Work a Specialty
326 River Street, CHICAGO

ALLENTOWN
ESTING LABORATORY
Inspecting and Testing Engineers and Chemists.
Cement and Aggregates, Steel, Paving Materials, Water Analyses
RNEST B. McCREADY, Director
373-77 Linden St., Allentown, Pa.

JAMES M. CAIRD
Assoc. Am. Soc. C. E.
CHEMIST and BACTERIOLOGIST
OFFICE AND LABORATORY
271 RIVER STREET TROY, N. Y.
Water Analysis and Tests of Filter Plants

Fuller & McClintock
CONSULTING HYDRAULIC ENGINEERS and SANITARY EXPERTS
170 Broadway, New York City
George W. Fuller James R. McClintock
Jesse K. Giesey

ohn W. Alvord and Chas. B. Burdick
CONSULTING ENGINEERS
Reports, Investigations, Plans and ecifications for Water Supplies, ater Purification, Water Power, werage, Sewage Disposal.
ARTFORD BLDG. CHICAGO

CHESTER & FLEMING
HYDRAULIC AND SANITARY ENGINEERS
Water Works, Water Filtration, Appraisements and Reports, Sewerage, Sewage Disposal, Operation of Properties.
UNION BANK BLDG. Pittsburgh

Gannett, Seelye & Fleming
CONSULTING ENGINEERS
Civil, Hydraulic, Sanitary, Electrical, Municipal Problems
204 LOCUST ST., HARRISBURG, PA.

HEFFIELD A. ARNOLD
Landscape Architect
Land Subdivisions
ity Parks Institution Grounds
Private Estates
) Bromfield St. Boston, Mass.

LOUIS S. COLE
LANDSCAPE ARCHITECT
14 E. Jackson Blvd.
CHICAGO, ILL.
Specialist in City Planning, Playgrounds, Parks and Cemeteries.

SAMUEL A. GREELEY
64 W. Randolph St., Chicago
Hydraulic and Sanitary Engineer
Sewerage, Sewage Disposal, Water Supply and Filtration, Garbage and Refuse Disposal, Treatment of Industrial Waste, Supervision of Operation.

RNOLD & TRIPP
Landscape Architects
ity Planning, Land Subdivisions, ity Parks, Institution Grounds, Private Estates
uardian Bldg., Cleveland, Ohio

WILLIAM E. CULLEN
Landscape Architect and Designer
Ornamental Gardening, Beautifying Homes, Rural Districts, Towns, Schools, Yards, Parks and Cemeteries.
BOULDER, COLORADO

JOHN H. GREGORY
Consulting Hydraulic Engineer and Sanitary Expert
170 Broadway, New York City
Reports, Investigations, Plans and Specifications for Sewerage, Sewage Disposal, Water Supply, Water Purification and Garbage and Refuse Disposal.

ansas City, Mo. Interstate Bldg.
BLACK & VEATCH
Consulting Engineers
werage, Sewage Disposal, Water Supy, Water Purification, Electric Lighting, ower Plants, Valuations, Special Investitions and Reports.

The Duluth Engineering Co.
W. B. PATTON, Mem. Am. Soc. C. E., Ex-City Engineer Duluth, Manager
MUNICIPAL ENGINEERS
Waterworks, Sewerage, Electric Lighting, Town Planning.
Suite 612-616 Palladio Building
DULUTH, MINN.

New York City 2 Rector Street
A. E. HANSEN
Hydraulic & Sanitary Engineer
Design & Supervision of Construction
Sewerage — Water Works
Sewage Disposal — Water Purification
Drainage — Water Works Valuation
Garbage Disposal — Water Analyses

A. H. BLANCHARD
L. Am. Soc. C. E. M. Can. Soc. C. E.
CONSULTING HIGHWAY ENGINEER
BROADWAY and 117th STREET
NEW YORK CITY

F. A. Dunham-Clarin Co.
CIVIL ENGINEERS
Municipal Engineering
Roads Sewers Supervision
Surveys
Topographic Title
Land Subdivisions
109 Park Ave. Tel. 610
PLAINFIELD, N. J.

James C. Harding,
Consulting Engineer and Sanitary Expert.
Water Supply and Purification. Refuse Disposal. Sewerage and Sewage Disposal. Investigations of Epidemics. Water Works Valuations. Supervision of Construction and Operation.
New York City, 170 Broadway

Sid. J. Hare — Fellow A.S.L.A.
S. Herbert Hare — Member A.S.L.A.

HARE & HARE
Landscape Architects
604 Gumbel Bld., Kansas City, Mo.
Plans and Reports for Parks, Park Systems, Land Subdivisions, Estates, Municipal Improvements, Cemeteries

HAZEN, WHIPPLE & FULLER
CONSULTING HYDRAULIC and SANITARY ENGINEERS
WATER SUPPLY and SEWERAGE
Allen Hazen — G. C. Whipple
W. E. Fuller — F. F. Longley
C. M. Everett — L. N. Babbitt
H. Malcolm Pirnie
30 East 42d St. NEW YORK CITY

Arthur H. Helder
Landscape Architect
413 Reliance Bldg. Kansas City, Mo.

Rudolph Hering, D.Sc.
Consulting Engineer
170 Broadway New York
WATER SUPPLY, SEWAGE AND REFUSE DISPOSAL
Over 40 years active practice in United States and Canada

J. Wallace Higgins
Assoc. M. Am. Soc. C. E.
CIVIL AND LANDSCAPE ENGINEER
Municipal Engineering, Sewerage, Parks, Cemeteries, Subdivisions, Topographic Surveys, Title Surveys, Estimates, Supervision
52 Vanderbilt Avenue, New York

Charles C. Hopkins
M. Am. Soc. C. E.
Consulting Hydraulic and Sanitary Engineer
349 Cutler Bldg., Rochester, N.Y.
Water supply and purification. Sewerage. Sewage and wastes disposal. Municipal engineering. Plans, reports, estimates, supervision. Expert testimony and appraisals.

LANDSCAPE DESIGN
Development of Parks, Cemeteries and Institution Grounds
Private Estates and Sub-divisions
M. H. HORVATH
Landscape Architect & Consulting Forester
710 Union Bldg., 1836 Euclid Ave.
Cleveland, Ohio

MUNICIPAL PROBLEMS
Budget Making—Salary Standardization—Centralized Purchasing—Cost Accounting—Public Utility Service and Rate Studies
J. L. JACOBS & COMPANY
Engineers—Cost Accountants—Municipal Experts
Monadnock Building Chicago

The
JENNINGS-LAWRENCE CO.
CIVIL AND MUNICIPAL ENGINEERS
511-12 Hartman Bldg.
COLUMBUS OHIO

GEORGE A. JOHNSON
M. Am. Soc. C.E.
Consulting Hydraulic Engineer and Sanitary Expert
150 Nassau St., New York.
Water Supply and Purification. Sewerage and Sewage Disposal. Plans and Reports. Supervision of Construction. Valuations. Improved Operation of Existing Plants. Investigation of Epidemics.

MORRIS KNOWLES
Consulting, Sanitary and Hydraulic Engineer
Municipal, Community and Civic Problems
Pittsburgh, Penna.

CHARLES W. LEAVITT
CITY PLANNING
and all branches of
CIVIL and LANDSCAPE ENGINEERING
220 Broadway NEW YORK

J. L. LUDLOW
Winston-Salem, N. C.
Consulting Municipal Engineer Sanitary and C ·ic Expert
Water Supplies, Sewage Disposal, Reports, Plans, Valuations, Appraisals. Efficiency and Economy Studies, Physical and Financial Reports on Public Utilities in Southern Cities. Advice in Municipal Sanitation and Public Health. Interviews by appointment in Eastern Cities.

THOMAS MEEHAN & SONS
Practical Landscape Gardeners and Engineers
Especially qualified for work involving use of hardy plants. Large estate developments: country clubs. Plans executed.
"We know plants"
6703 Chew Street, Germantown, Phila., Pa.

HUGH C. MITCHELL
GEODETIC ENGINEER
CONSULTANT ON CITY TRIANGULATION PRECISE LEVELS, AND TOPOGRAPHIC SURVEYS.
601 West 32d Street
AUSTIN, TEXAS

FRANK H. NUTTER
Landscape Architect and Engineer
710 Sykes Block, Minneapolis, Minn.
Advice, Sketches, Designs or full Working Plans for Parks, Cemeteries, Public or Home Grounds Surveys made if desired. Correspondence Solicited
City Park Engineer from 1883 to 1906

POLLOCK AND TABE
CONSULTING ENGINEERS
Pavements, Highways, Water Supp
Drainage, Sewerage and Sewage Dispo
Designs, Specifications and Supervisio
CLARENCE D. POLLOCK } Member
GEORGE A. TABER } Am. Soc. C.
Park Row Building, New York C

Alexander Potter, C.
Hydraulics, Sanitation, Co
crete Structures Designed
Executed.
50 Church Street, New Yo
(Hudson Terminal) Tel., Cortlandt 5

Clyde Potts
50 CHURCH ST. NEW YO
Civil and Sanitary Engineer
Sewerage and Sewage Disposal Wo
Hydraulics, Water Works, Filtrat
Reports, Plans and Estimates.

VICTOR A. RIGAUMONT
CITY PLANNER
Ferguson Bldg., Pittsburgh, Penn
INDUSTRIAL HOUSING
MUNICIPAL BUILDINGS
PARKS AND PLAYGROUND
Thoroughfares—Transportation

LOUIS E. STANDE
Certified Public Accountant
Municipal and Public Utility Accoun
Rate and Capitalization Cases
200 Fifth Avenue, New Yor
Chief Acct.—Bd. of Ed. 1899-1907
Acct—Pub. Service Com. 1908-191
Chief Auditor—Dept. Water Supply,
and Electricity, 1912-1916.

Sewage Disposal Plan
for Country Residences, Factories and In
tutions. Standard Plans and Specificat
including description and estimate of
of modern sewage treatment.
Blue Prints, 12 sheets, 9" x 12", $5.00
LeRoy K. Sherman, Sanitary Engin
1102 Tacoma Bldg., Chicago.

Henry W. Taylo
HYDRAULIC AND SANITA
ENGINEER
26 Cortlandt St., New Yo
100 State Street, Albany, N.Y
Water Supply, Water Purification, Sew
age, Sewage Disposal, Reports, Plans,
pervision of Construction and Maintena

L. SCOTT TWOGOO
Civil and Sanitary Engine
1514-15 Bank of Commerce and Trust B
MEMPHIS, TENN.
Water Supply, Water Purification, Sewe
Systems, Sewage Disposal, Reinforced C
crete Structures, Municipal Improveme
Operation of Purification Plants, Laborat
for Analysis of Water and Sewage.

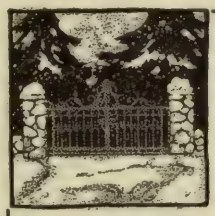
Waddell & Son
Consulting Engineers
Movable Bridges, Reinforced Concrete and Steel Structures, Elevated Railways, Reports, Checking of Plans, Advisory Services and Appraisal.
Main Office, Kansas City.
New York Office, 35 Nassau Street.

WARREN ENGINEERING CO.
Specializing in Municipal Water Supply and Purification, Sewerage and Sewerage Disposal, Paving.
DECATUR ILLINOIS

MARK WOLFF
Certified Public Accountant
Consultant
Rate & Capitalization Cases
Gas, Electric & Water Utilities
1328 Broadway
New York City
Municipal Accounting

Robert W. Hunt Jno. J. Cone Jas. C. Hallsted D. W. McNaugher
ROBERT W. HUNT & CO.,
GENERAL OFFICES:
2000-175 W. Jackson Blvd., Chicago, Ill.
ENGINEERS, INSPECTORS, CHEMISTS
Inspection Steel and Cement for Buildings and Bridges, Paving Materials, Cast Iron Pipe.
Inspectors Permanently at Points of Manufacture.

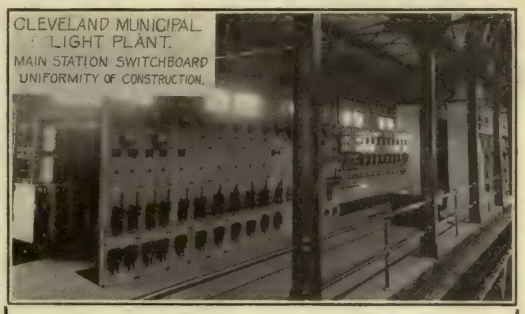
BAKER
Road and Street Products
Everything Guaranteed
Baker Dustless Pick-up Sweeper
Baker Street Carts and Can Carriers
20th Century Horse Drawn Snow Plows
20th Century Road Graders and Drags
Baker Portable Wagon Dump Boxes
Maney Self loading 4-wheel Scrapers
48 page catalog on request
THE BAKER MFG. CO.
503 Stanford Ave. Springfield, Illinois



WHAT IS QUALITY?
IN PAINT IT IS DEPENDABILITY—ECONOMY
DIXON'S SILICA-GRAPHITE PAINT
is said by users to be the longest service paint for protection of metal and wood surfaces. Made for over 50 years in FIRST QUALITY only, which is a guarantee of satisfaction and reliance.
If interested, let us send you convincing proofs, and Booklet No. 107-B.
Made in JERSEY CITY, N. J., by the
JOSEPH DIXON CRUCIBLE CO.
Established 1827

ORANGEBURG FIBRE CONDUIT

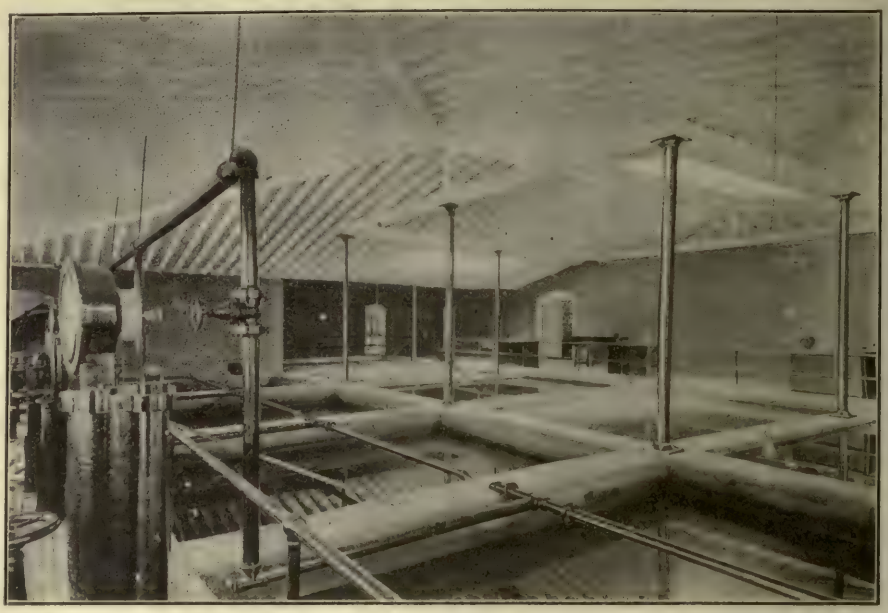
Book "D" on request
THE FIBRE CONDUIT CO.
Orangeburg, N. Y.
New York Boston Chicago San Francisco



We Can Do The Same For You!
We are Consulting Engineers for Municipalities.
We designed, built and operated the Cleveland Municipal plant. Its maximum rate is 3 cents per K. W. hour.
We represent cities in negotiations with the Utility Corporations.
We prepare valuations and represent cities before the State Commissions in rate cases for Electric Light, Gas, Telephone, Water Works and Railway Fare Cases.
Write for Printed Matter
F. W. BALLARD & CO.
Engineers
Swetland Building Cleveland, Ohio

The Best Preservative for Wood Block Pavements
REILLY'S IMPROVED PERMANENT PATENTED CREOSOTE OIL
Republic Creosoting Co., Indianapolis, Ind.
Plants: Indianapolis Minneapolis Mobile Seattle

DU PONT AMERICAN INDUSTRIES



Safeguard Your Drinking Water

Mark X before subject that interests you and **Mail This Coupon** to
E. I. du Pont de Nemours & Co.
Advertising Division
Wilmington A. C. Delaware

- ___ Filter Alum
- ___ Vitrolac Stain Finish
- ___ Flowkote Enamel
- ___ Sanitary Wall Finish
- ___ Town and Country Paint
- ___ Industrial Paints
- ___ Trapshooting
- ___ Antoxide Iron Paint
- ___ Py-ra-lin Toilet Goods
- ___ Challenge Collars
- ___ Fabrikoid Upholstery
- ___ Industrial Dynamites
- ___ Farm Explosives

Name.....
Address.....
City.....
State.....

Visit the Du Pont Store
Atlantic City, N. J.

Here is a tried and proved alum, containing over 70% Aluminium Sulphate and made especially for use in mechanical filter plants. Municipal drinking supplies all over the Nation are being safeguarded by the use of this product. City engineers and officials who have the welfare of the citizens at heart, are specifying in their filtration process:

HARRISONS
Concentrated Filter Alum
(a Du Pont Product)

The removal of the impurities in the water supply is easily accomplished and laboratory analyses of the water before and after filtration show a remarkable decrease in the bacteria content when Harrison's Filter Alum is used. Its price makes it economical and its high quality makes it necessary.

Protect your city's health by ordering now.

HARRISON WORKS
Owned and Operated by
E. I. du Pont de Nemours & Co.
35th St. and Gray's Ferry Road - Philadelphia, Pa.

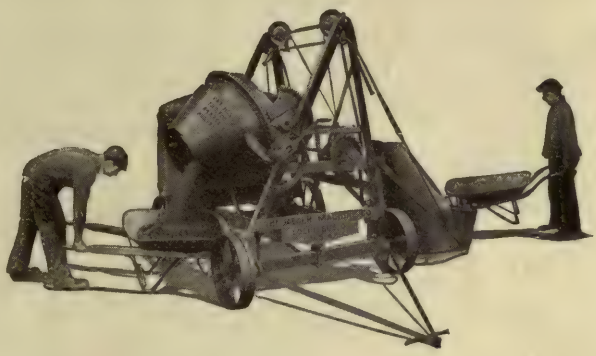
DU PONT

Jaeger Concrete Mixer

Used by progressive municipalities and contractors.

Especially adapted to "speed-up" work.

Write us for detailed information.



THE JAEGER MACHINE CO.

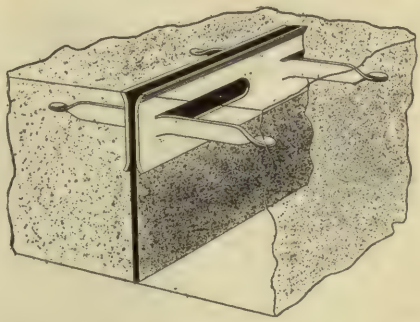
215 W. Rich Street :: Columbus, O.

The TAYLOR

PORTABLE STEEL DERRICK with Gondola Car Attachment for HANDLING PIPE or other heavy material from gondola cars.

Catalog illustrating the Taylor Portable Steel Derricks furnished on application.

TAYLOR PORTABLE STEEL DERRICK CO.
213 W. Grand Ave., Chicago, Ill.



BAKER IMPROVED ARMOR PLATE

Protect the expansion joint of the concrete pavement. Keep it from breaking down under traffic by specifying steel protected joints.

Baker *Bevel Edged Plate,* easy to install and will wear down with the pavement.

Ask about Baker Armor plates and Installation System.

THE R. D. BAKER CO., DETROIT, MICH.

Cutting the Cost of Culverts

Means and methods of accomplishing these very desirable savings are described in the booklet shown herewith, which will be sent to any one without obligating him in the least.

This booklet is published *for distribution.* If you are interested directly or indirectly in culverts or culvert construction, it will be well worth your while to read this illustrated treatise on the subject, and we will be pleased to send it to you on request.

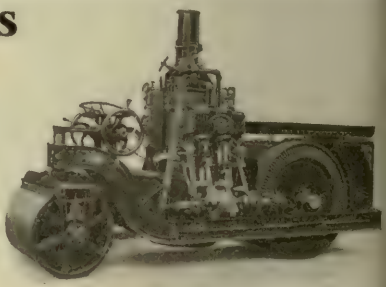
STORMS MFG. CO. 347 Monadnock Block CHICAGO

ERIE TANDEM PAVING ROLLERS

Includes everything that makes for the best in Road Rollers. They are strong, simple in construction—durable and economical and easy to operate. Our first roller built in 1887 is still doing its "bit."

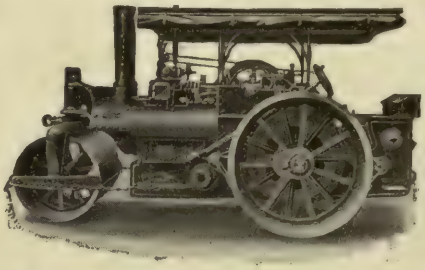
Erie Rollers are guaranteed against breakage or wear for 5 years.

Write for illustrated material.



THE ERIE MACHINE SHOPS ERIE, PA.

QUALITY MACHINERY



BUFFALO PITTS ROLLERS

Are purchased by discriminating buyers because of the many years of satisfactory service which they will render, the low repair costs and their general reliability.

ASK THOSE WHO OWN THEM

All sizes All Types Write for catalogue

Built only by

THE BUFFALO-SPRINGFIELD ROLLER COMPANY
SPRINGFIELD, OHIO

MOTOR TRUCK AND HORSE DRAWN

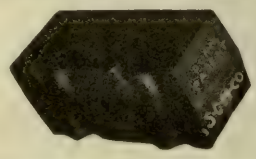
FLUSHERS—SPRINKLERS—OILERS

Also Flushing, Sprinkling and Oiling Units complete for mounting on trucks

E. D. ETNYRE & CO. : OREGON, ILL.

SOUTHERN CLAY MFG. CO.

James Building
CHATTANOOGA, TENN.

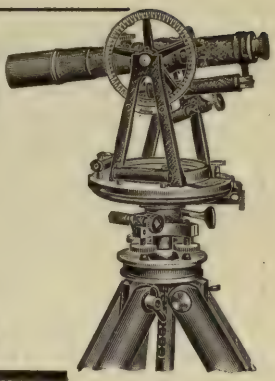


Annual Capacity:
Thirty Million Paving Block

Manufacturers of

WIRE-CUT-LUG BLOCKS
DUNN PATENT

KOLESCH SURVEYING INSTRUMENTS



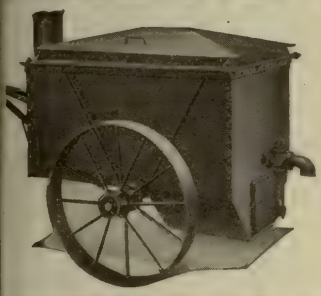
Will meet any test for accuracy and durability. Add to this that they are moderate in price and it is plain you should investigate them when in need of Transit or Level to give satisfaction.

Send for terms of our free offer to Municipal Engineers for test on their own work.

K TRADE MARK

KOLESCH & CO., 138 Fulton Street, New York

Littleford Tar Heaters



Many municipalities have found the "Littleford" a valuable and economical asset in Street Repair work.

Write for booklet.

LITTLEFORD BROS. 500 E. Pearl St., Cincinnati

BUFF

ENGINEERING INSTRUMENTS

are the strongest, most accurate and longest-lived Instruments built. The close accuracy, high grade materials and superior workmanship have made the Buff the recognized standard. *Write for catalog No. 4.*

BUFF & BUFF MFG. CO. Jamaica Plains, BOSTON, MASS.

221 Lamartine Street — 231 N. Wells Street, Chicago, Ill.

10 SIZES and Styles of Road Graders

Our Largest — the MOGUL 12 ft. blade, wt. 7000 lbs. Requires 25 h. p. tractor.

For Real Economy "Buy the largest machine for which power is now or will soon be available."

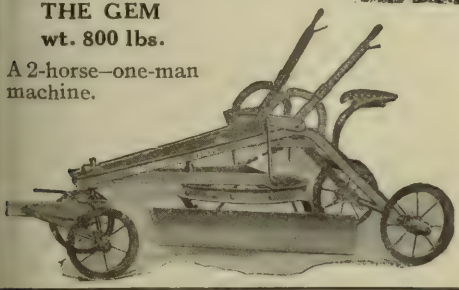
Get our 1918 Catalog

Our smallest

THE GEM

wt. 800 lbs.

A 2-horse—one-man machine.



A Million Dollar Corporation Specializing on Road Machinery

Elevating Graders, Plows, Scrapers, Road Drags, Corrugated and Cast Iron Culverts, Steel Beam Bridges, etc.

RUSSELL GRADER MFG. CO.
Minneapolis, Minn.

Representatives in Principal Cities of U. S. and Canada

UNIFORMITY

is a prime requisite of WARRENITE—The Country Road Surface, and is safeguarded by systematic testing to insure the highest standard possible in the mixture of

WARRENITE Road Surface

These tests are made by expert chemists of real authority.

Now in time of war county officials should not spend money experimenting—their efforts should be directed toward a standard surfacing which has already stood the test as to motor transportation and varying climatic conditions as has

WARRENITE

Trunk line highways are necessary to relieve the overburdened railroads of the freight congestion.

Highways should be encouraged and built at once. Never were they more needed than at the present time

BUT

these highways should be built of a material which will give you a well paved highway for years to come.

Insist on
WARRENITE
The Ideal Country Road Surface
All to gain—Nothing to Lose

Write today for WARRENITE circulars, specifications, and form of mixture agreement available to all contractors and learn more about this modern ideal country road surface. **It is to your advantage.**

Warrenite, Rockrimmon Road, near Chicopee, Mass.

WARREN BROTHERS COMPANY

Executive Offices: Boston, Mass.

District Offices:

New York, N. Y.
San Francisco, Cal.
Richmond, Va.
St. Louis, Mo.
Chicago, Ill.
Portland, Ore.
Nashville, Tenn.
Winnipeg, Man.
Los Angeles, Cal.
Phoenix, Ariz.
Utica, N. Y.
Montreal, P. Q.
Toronto, Ont.
Vancouver, B. C.

CONNERY'S NON-LEAKABLE WELDED

"HELD BY WELD" TAR AND ASPHALT KETTLES

COMBINATION HEATER AND DRYER

All Sizes and Styles.
Write for Specification.
Combination Heater and Dryer.
Separate yet combine One Fire so arranged to give required Heat.
Note the Improved Shut Off Door.
A Wonder for Repair Work.

Style "P"
10 Gallon Cap. Inside Pot lifts out, can be used for pouring Pot. Used by Highway Division Superintendents to patch small holes in road.

Stock Carried in Large Cities

STYLE "P"

Mfd. by CONNERY & CO. Inc., 2nd and Luzerne Sts., Philadelphia, Pa.

PENNSYLVANIA PORTLAND CEMENT

"One Source—One Mill—One Standard"

Every bag of Pennsylvania Cement, wherever obtained and for whatever purpose, has the same high quality required for government and public service work in which it is extensively used. Ask your dealer for Pennsylvania. If he cannot supply you, write direct to

Pennsylvania Cement Company, 30 East 42nd St., New York

SAVE YOUR ROADS AND PREVENT DUST

The road surface will remain smooth, firmly packed and free from dust without sprinkling even in the hottest and dryest weather if

SOLVAY

Granulated

Calcium Chloride

is used. Sown dry by inexpensive horse distributor or hand spreader, Calcium Chloride upon exposure to the air absorbs moisture and causes the road surface to pack firmly. Two applications a season will keep roads and streets cool, clean, dustless and wear-resisting at a moderately low cost.

Solvay is odorless and stainless, and does not discolor the road surface. It has no objectionable features, and in working into the road aids in the natural cementing of rock and soil.

You will find this treatment by far the most permanently efficient road binder and dust preventive.

Write for illustrated Road Book

SEMET-SOLVAY CO.

410 Milton Ave. Solvay, N. Y.

BUY WAR SAVINGS STAMPS!

Adams Scarifier-Grader Resurfacing Macadam Road

Saves Time—Power—And Does More Work

In scarifying or grading and shaping up gravel or macadam streets, the Adams Leaning-Wheel Scarifier Grader does more work, and does it with less power, because it leans *against* the load. Through its use officials are able to cut their repair costs tremendously. The

ADAMS
ADJUSTABLE
Leaning-Wheel
GRADER

is guaranteed in actual road building or maintenance, to move more dirt with less power (mold board scouring and without side draft on the power) than any other grader of same length blade.

The economy and efficiency of the ADAMS Adjustable Leaning-Wheel Grader can be PROVED by TEST on your own roads. Write for free illustrated catalog showing ADAMS Adjustable Leaning-Wheel Graders at work under various conditions. Ask for Catalog C.

The ADAMS Leaning-Wheel Grader leans against the load just as you'd do if you were pushing a loaded wheelbarrow up a hill. Catalog C gives full information.

J.D. ADAMS & CO.

Road Building Machinery

INDIANAPOLIS, IND.

and so does the ADAMS grader

CONCRETE FOR PERMANENCE

Springtime
is mud time

Every vehicle caught hub-deep in the mud holds back the business development of some community.

And it is also a warning of road-rebuilding costs that must come sooner or later.

Lay concrete roads

The first cost is about the same as that of any good road. The after-cost averages only $30 per mile per year—and the concrete road is at its best for *years* after roads of other materials must be built anew.

Concrete roads last, and save the municipal treasury's dollars for other undertakings.

"Concrete Highway Construction" is the free book that tells of this. Send for a copy. And the Atlas Highway department prepares plans, proposals and cost estimates on request and arranges for inspection, if desirable.

The Atlas Portland Cement Company

Member of the Portland Cement Association

30 Broad Street, New York — Corn Exchange Bank Bldg., Chicago
Philadelphia Boston — St. Louis Minneapolis
Des Moines Dayton Savannah

PORTLAND
ATLAS CEMENT
"The Standard by which all other makes are measured"

Westinghouse

The Pittsburgh City and County Building Switchboard

THE DISTRIBUTING BOARD is divided into six general sections, namely:

1. County Light, 110-220 Volts, A. C.
2. City Light, 110-220 Volts, A. C.
3. General Light, 110-220 Volts, A. C.
4. County Power, 220 Volts, D. C.
5. City Power, 220 Volts, D. C.
6. General Power, 220 Volts, D. C.

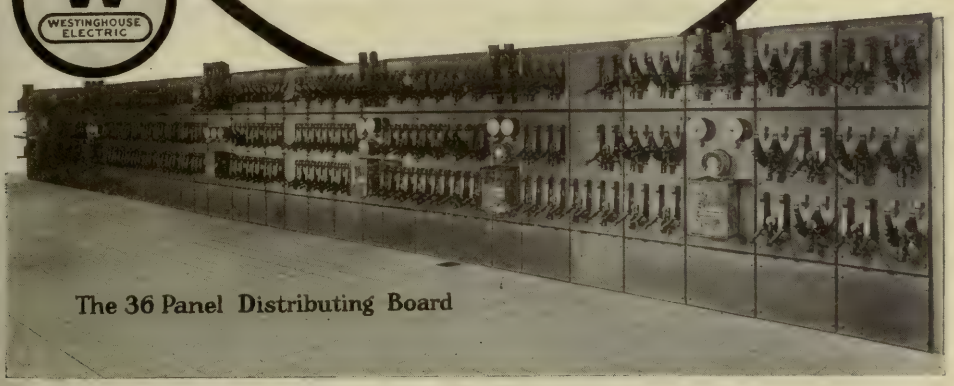
This board controls a total of 111 feeder circuits of 300-ampere capacity or less, 50 lighting feeders and 61 power feeders. Type CD carbon circuit breakers with full automatic feature are used throughout, and the breakers controlling the power feeders are equipped with self-contained inverse time element dash pots.

Each of the six sections has an incoming-power panel ranging in capacity from 1,000 to 3,000 amperes protected by Type CA carbon circuit breakers with voltmeter, ammeter, watthour meter and graphic wattmeter, for indicating and recording the total amount of power used by each section of the board.

THE A. C. BOARD has six panels and controls two 2,200-volt, three-phase, 60-cycle incoming lines from Duquesne Light Central Station service, and the A.C. side of two 300-K.W., one 200-K.W. and one 100-K.W. 6-phase A.C., 250-volt D.C. converters. Protection to the incoming lines and the step-down transformers is afforded by means of Type F-2, electrically-operated oil circuit breakers, which are mounted in a pipe structure in the rear of the board.

THE D.C. BOARD has seven panels and controls the D.C. side of the four converters, as well as two 2,000-ampere, two 1,200-ampere and two 1,000-ampere power feeders. This entire switchboard installation was built according to specifications of Edward B. Lee, Architect.

W WESTINGHOUSE ELECTRIC



The 36 Panel Distributing Board

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

Proposal and For Sale Notices, Help Wanted and Situation Wanted Advertisements, Etc.

NOTICE OF BRIDGE LETTING
WISCONSIN AND MICHIGAN INTERSTATE BRIDGE

LANSING, MICH.

Sealed proposals will be received until 1:30 Wednesday afternoon, May 15, 1918, jointly, by Frank F. Rogers, Michigan State Highway Commissioner, Lansing, Mich., and E. A. Thieman, Secretary of Florence County Road and Bridge Committee, Florence County, Florence, Wis., at the office of Dickinson County Road Commission, County Building, Iron Mountain, Mich., for the construction of a reinforced concrete arch crossing Menominee River between Section 12, T. 39 N., R. 3 W., Breitung Township, Dickinson County, Michigan, and Section 11, T. 38 N., R. 19 E., Florence County, Wisconsin.

The arch consists of two 80-ft. spans, one 85-ft. span and approaches with an overall length of 336 feet and 20-ft. width of roadway, containing approximately 1,220 cubic yards of reinforced concrete.

For inspection of bridge site see G. V. Carpenter, County Engineer, Iron Mountain, or E. A. Thieman, Secretary of Florence County Road and Bridge Committee, Florence County, Florence, Wis. The location is approximately 75 yards up stream from the old bridge, now in place on the road from Florence to Iron Mountain, or approximately three miles south of Iron Mountain.

For plans, specifications and proposal blanks write the undersigned.

A certified check in the amount of $500 is required with each bid. The right is reserved to reject any or all bids.

FRANK F. ROGERS,
State Highway Commissioner,
Lansing, Mich.

E. A. THIEMAN,
Secretary Florence County Road and Bridge Committee, Florence, Wis.

BIDS—STATE AID PROJECTS

RED WING, MINNESOTA

Notice to Contractors: Sealed proposals will be received at the office of the County Auditor of Goodhue County, Minnesota, until 1 o'clock P. M., May 17, 1918, for the construction of state aid projects as follows:

Project No. 1803, State Road No. 1, town of Pine Island, length 2.1 miles, which involves the following items:

Clearing and grubbing, .25 acre.
Excavation earth, 11,795 cubic yards.
Excavation loose rock, 1,100 cubic yards.
Excavation, solid rock, 300 cubic yards.
Overhaul, 29,802 cubic yards.
Guard rail, 900 lineal feet.
Installing and furnishing material for sectional concrete culverts:
12-inch—120 feet.
18-inch—20 feet.
24-inch—90 feet.
Gravel surfacing, 2,610 cubic yards.
Reinforced concrete culverts:
1 Ext. W, 55 x 9 feet.
2 Ext. F, 32 x 26 feet.
1 Ext. W, 108 x 26 feet.

Project No. 1804, State Road No. 1, town of Zumbrota, 2.22 miles, which involves the following items:

Clearing and grubbing, .75 acre.
Excavation, 12,983 cubic yards.
Overall, 8,948 cubic yards.
Guard rail, 1,000 lineal feet.
Installing and furnishing material for sectional concrete culverts:
12-inch—170 feet.
18-inch—100 feet.
24-inch—60 feet.

Project No. 1805, State Road No. 7, town of Holden, 1.20 miles, which involves the following items:

Clearing and grubbing, .25 acre.
Excavation, 15,337 cubic yards.
Overhaul, 17,285 cubic yards.
Guard rail, 3,400 lineal feet.
Installing and furnishing material for sectional concrete culverts:
12-inch—90 feet.
18-inch—30 feet.
24-inch—30 feet.

Plans and specifications may be examined at the office of the County Auditor of said county, or at the office of the State Highway Department, 300 Shubert Building, St. Paul, Minn. Blue prints of plans may be obtained from the State Highway Department at bidder's expense. The right is reserved to reject any or all bids and to waive any defects. Bids must be accompanied by certified check, payable to the County Treasurer of said county, for at least 5 per cent of the amount of proposal. All bids must be submitted on blanks furnished by this office or the office of the State Highway Department.

Dated at Red Wing, Minn., this 23d day of April, 1918.

C. H. MEYER,
Auditor of Goodhue County, Minn.

Playground Apparatus Business For Sale

A manufacturer desires to dispose of the playground apparatus end of his business on account of the fact that the other lines manufactured necessitate the space at present occupied by the playground apparatus department. An interesting proposition will be made to anyone desiring to go into the playground apparatus business or to any manufacturer of another line who can add a department for the manufacture of playground equipment. Address Playground Apparatus, care of THE AMERICAN CITY, Tribune Bldg., New York.

Experienced Commercial Secretary Wants Bigger Job.

Here's an opportuni for some commercial o ganization to secure t services of a thorough trained and efficient se retary. One who can ke things humming. Good o ganizer and forceful spea er. Knowledge of Pu licity and Journalism. W consider small city to Can furnish excellent cr dentials. Address Box 2 American City.

To the Secretary o a Chamber of Commerce

If you have ability in th Chamber of Commerce fie a good opening is now ava able which may intere you. Send a memorandu of your experience an salary desired. Box 10 The American City.

Engineer Wanted

We are looking for an en gineer who is experienced Street and Sewer Constru tion. We would like a ma who would be willing grow up with the city. fair salary is offered to th right man.

J. L. Ekstrom, City Cler Boyne City, Mich.

A City Official

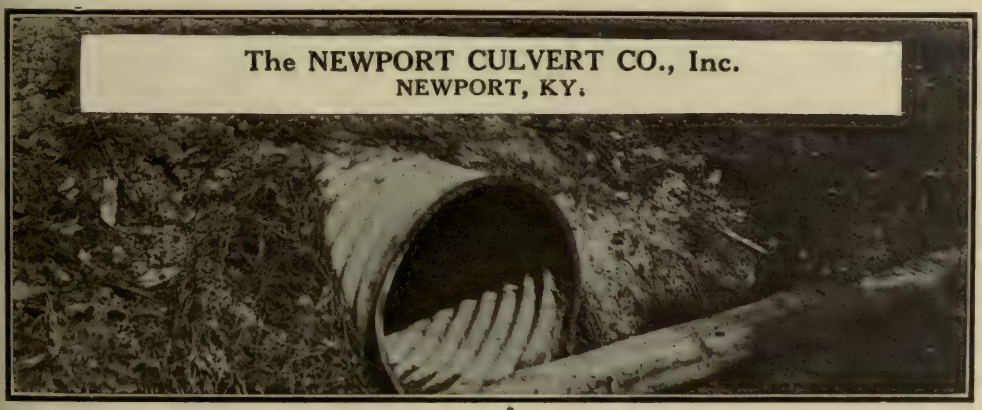
writing us recently says among other things: "Your

'Genuine Open Hearth Iron' Culverts

are certainly well well adapted to city use as they can be laid nearer the surface of our streets than other types of culvert and are much easier installed than the pipes that come in short sections."

A pure Iron-Copper Alloy Sheet with a heavy spelter coat makes an ideal material for culvert construction. And that's what our culverts are made of.

They are practically permanent. Let us send you our booklet and prices.



The Municipal Buyers' Guide

A classified reference index of advertisers in this issue of The American City

The alphabetical index of advertisers which follows this list (see page 112) will give you the page numbers of all advertisements, thus enabling you to secure the full address of the advertisers, as well as other information which may be of value.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 112

Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark.

Aerial Ladder Trucks.
Couple-Gear Freight-Wheel Co.

Air Compressors.
General Electric Co.
Modern Iron Works.
Water Works Equipment Co.
Worthington Pump & Mach. Corp.

Air and Gas Washers.
Spray Engineering Co.

Ambulances.
White Co., The.

Antoxide.
Harrisons, Inc.

Arc Lamps.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Armored Concrete Pavements.
Truscon Steel Co.

Asbestos.
Carey Co., Philip.

Asphalt.
Carey Co., Philip.
Pioneer Asphalt Co.
Standard Oil Co.
Warren Bros. Co.

Asphalt Machinery.
Casey-Hedges Co.
Connery & Co., Inc.
Erie Machine Shops
Littleford Bros.
Warren Bros. Co.

Automobile Fire Apparatus.
American-La France Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Couple-Gear Freight-Wheel Co.
Federal Motor Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
The White Co.

Automobile Lubricants.
Joseph Dixon Crucible Co.

Belt Dressing.
Joseph Dixon Crucible Co.

Blasting Supplies.
DuPont de Nemours & Co., E. I.

Blue Print Paper and Machines.
Kolesch & Co.

Books.
Appleton & Co., D.
Wiley & Sons, John.

Braces, Extension.
Bond & Co., Harold L.
Modern Iron Works.

Brass Goods.
Anderson Coupling & Fire Sup. Co.
Clark Co., H. W.
Modern Iron Works.
Smith Co., A. P.
Water Works Equipment Co.

Brick, For Paving.
Dee Co., Wm. E.
Metropolitan Paving Brick Co.
National Paving Brick Mfrs. Assn.
Southern Clay Mfg. Co.

Buses, Motor.
White Co., The.

Calculating Machines.
Marchant Cal. Machine Co.

Campaigns for Commercial Organizations.
American City Bureau.

Cans for Ashes and Garbage.
American Can Co.
Buffalo Municipal Equipment Co.
Butler Mfg. Co.
Newport Culvert Co.
Rochester Can Co.

Cast Iron Pipe.
Donaldson Iron Co.
Glamorgan Pipe & Foundry Co.
Lynchburg Foundry Co.
Massillon Iron and Steel Co.
U. S. Cast Iron Pipe & Fdry. Co.
Warren Foundry & Machine Co.
Zelnicker Supply Co., W. A.

Catch Basins.
Buffalo Municipal Equipment Co.
Casey-Hedges Co.
Clark Co., H. W.
Dee Co., Wm. E.
Modern Iron Works.
U. S. Cast Iron Pipe & Foundry Co.

Catch Basin Cleaning Apparatus.
Otterson Auto-Eductor Co.

Caulking Machinery.
Smith Co., A. P.

Caulking Materials.
Leadite Co.
Modern Iron Works.
United Lead Co.

Cemcoat.
Sonneborn Sons, Inc., L.

Cement.
Atlas Portland Cement Co.
Pennsylvania Cement Co.

Cement Inspection.
Allentown Testing Laboratories.
Hunt & Co., Robt. W.

Centrifugal Pumps.
Shone & Co.
Worthington Pump & Mach. Corp.

Certified Public Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark.

Check Valves.
Columbian Iron Works.

Chemical Analysis.
Allentown Testing Laboratories.
Hunt & Co., Robt. W.

Chemical Engines.
American-La France Fire Eng. Co.
Anderson Coup. & Fire Sup. Co.

Chemical Engineers.
Hunt & Co., Robt. W.

Chemicals for Water Purification.
Arnold, Hoffman & Co.
Bush-Beach & Gent.
Electric Ozone Sterilizer Co.
Electro Bleaching Gas Co.
General Filtration Co.
Great Western Electro Chem. Co.
Pennsylvania Salt Mfg. Co.
Wallace & Tiernan Co., Inc.

Coal Tar.
Barrett Co., The.
Carey Co., Philip.

Cold Storage and Refrigerati Systems.
Spray Engineering Co.

Concrete Culverts.
Storms Mfg. Co.

Concrete Lighting Standards.
Chicago Concrete Post Co.

Concrete Mixers.
Jaeger Machine Co.
Worthington Pump & Mach. Cor

Conduit Rods.
Bond & Co., Harold L.
Turbine Sewer Machine Co.

Conduits.
Fibre Conduit Co.

Contractors' Equipment.
Adams & Co., J. D.
Austin-Western Road Machy. Co
Baker Mfg. Co.
Bond Co., Harold L.
Connery & Co., Inc.
Federal Motor Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Good Roads Machinery Co.
Littleford Bros.
Packard Motor Car Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.
Universal Road Machinery Co.

Contractors for Water Main Clean ing.
National Water Main Cleaning Co

Culverts.
American Cast Iron Pipe Co.
Casey-Hedges Co.
Dee, Wm. E., Co.
Good Roads Machinery Co.
Newport Culvert Co.
Truscon Steel Co.
Storms Mfg. Co.
U. S. Cast Iron Pipe & Foundry Co
Wood & Co., R. D.

Curb Bar.
Baker Co., R. D.
Truscon Steel Co.

Curb Boxes.
Casey-Hedges Co.
Clark Co., H. W.
East Iron & Machine Co.
Modern Iron Works.
S. E. T. Valve & Hydrant Co.

Current Meters.
Westinghouse Electric & Mfg. Co.

Derricks.
Taylor Portable Steel Derrick Co.

Drawing Instruments and Supplies.
Economy Drawing Table Co.
Kolesch & Co.

Dump Carts and Wagons.
Austin-Western Road Machy. Co.
General Motors Truck Co.
Watson Wagon Co.

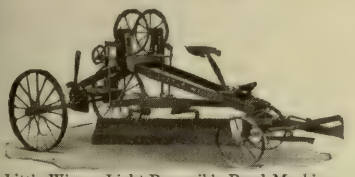
Dumping Wagon Bodies.
Austin-Western Road Machy. Co.

Continued on page 104

HERE IT IS The most complete Catalog of Road Building Machinery issued in this year of 1918

Whether you need Road Machinery or not, you need a copy of this interesting book. It is yours free and without obligation if you ask for it.

We can't tell you all about our Road Building Equipment in this space. Our Catalog tells the story. A copy is reserved for you.



Little Winner Light Reversible Road Machine. Made in several sizes—6, 8, 10 and 12 ft. Blades.

We furnish Road Graders for every class of work, light, medium heavy or extra heavy. Our graders are known all over the country for their durability and excellent working qualities. Before you purchase a Road Grader, don't fail to investigate the Winner line.

We furnish Guaranteed Repairs for All Standard Road Machines

Check the Machine or Machines you are interested in, cut out this coupon and mail to us. We will be glad to submit prices and full information, together with a copy of the Catalog shown above.

Address: THE GOOD ROADS MACHINERY CO., Inc., Kennett Square, Pa.

THIS IS OUR LINE:

- ☐ Light Road Grader
- ☐ Medium Road Grader
- ☐ Heavy Road Grader
- ☐ Rock Crusher
- ☐ Steam Road Roller
- ☐ Tandem Roller
- ☐ Oiling Machine
- ☐ Heating Kettle
- ☐ Gravel Screening Plant
- ☐ Gravel Crushing Plant
- ☐ Street Sweeper
- ☐ Street Sprinkler
- ☐ Hauling Engine
- ☐ Road Drag
- ☐ Wheel Scrapers
- ☐ Drag Scrapers
- ☐ Road Plows
- ☐ Car Unloaders
- ☐ Culvert Pipe

THE GOOD ROADS MACHINERY CO., Inc.
Kennett Square, Pa.

Please send me full information on the Lines checked, with prices:

Name .....

Street Address .....

City .....

State .....

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 112

Dust Laying Compounds.
Barrett Mfg. Co.
Dustoline for Roads Co.
Semet-Solvay Co.
Standard Oil Co.

Electric Current Meters.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Generators and Motors.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Lamp Fixtures.
Cutter Co., George.
Electric Railway Equipment Co.

Electric Lamps.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electrical Supplies.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Enameled Iron Signs.
Baltimore Enamel & Novelty Co.

Engineers' and Surveyors' Instruments.
Buff & Buff Mfg. Co.
Kolesch & Co.

Engineers, Consulting.
Albright & Mebus.
Alvord, John W., & Brudick, Chas.
Ballard & Co., F. W.
Black & Veatch.
Blanchard, A. H.
Burns & McDonnell.
Caird, James M.
Chester & Fleming.
Cravath, J. R.
Crosby, W. W.
Duluth Engineering Co.
Dunham-Clarin Co.
Flood, Walter H.
Fuller & McClintock.
Gannett, Seelye & Fleming.
Greeley, Samuel A.
Gregory, John H.
Harding, James.
Hazen, Whipple & Fuller.
Hering, Rudolph.
Higgins, J. Wallace.
Hopkins, Charles C.
Hunt & Co., Robt. W.
Jennings, Lawrence & Lindsey.
Johnson, Geo. A.
Knowles, Morris.
Leavitt, Chas. W.
Ludlow, J. L.
McCrary Co., J. B.
Minnesota Engineering Co.
Mitchell, Hugh C.
Pollock, Clarence D.
Potter, Alexander.
Potts, Clyde.
Scofield Engineering Co.
Utilities Engineering Co.
Warren Engineering Co.

Engine, Gas. (See Gas Engines.)

Expansion Joint Material.
Barrett Mfg. Co.
Carey Co., Philip.
Pioneer Asphalt Co.
Truscon Steel Co.

Fencing.
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Co.
Wright Wire Co.

Fertilizers.
Dreer, Henry A.

Filing Cabinets.
Ecomony Drawing Table Co.

Filters-Feed Water.
Pittsburgh Filter Mfg. Co.

Filtration Plants.
N. Y. Continental-Jewell Filtra. Co.
Norwood Engineering Co.
Pittsburgh Filter Mfg. Co.

Fire Alarm Cables.
Simplex Wire & Cable Co.

Fire Alarm Signals, Steam.
Union Water Meter Co.

Fire Alarm Systems.
Anderson Coupling & Fire Sup. Co.
Gamewell Fire Alarm Telegraph Co.
Loper Fire Alarm Co.

Fire Department Apparatus.
American-LaFrance Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Couple-Gear Freight-Wheel Co.
Federal Motor Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
South Bend Motor Car Works.
White Co., The.

Fire Department Supplies.
Anderson Coupling & Fire Sup. Co.

Fire Escapes.
Barnum Iron Works, E. T.

Fire Extinguishers, Chemical.
American-LaFrance Fire Engine Co.
Anderson Coupling & Fire Sup. Co.

Fire Hose.
Anderson Coupling & Fire Sup. Co.
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

Fire Pumps.
Worthington Pump and Machinery Corporation.

Flag Poles.
Barnum Iron Works, E. T.

Flexible Joints.
U. S. Cast Iron Pipe & Fdry. Co.

Flower Bed Guards.
Barnum Iron Works, E. T.
Wright Wire Co.

Fountains.
Barnum Iron & Wire Works, E. T.
Casey-Hedges Co.
Mott Iron Works, J. L.
Puro Sanitary Drinking Foun. Co.
Rundle-Spence Mfg. Co.
Stewart Iron Works Co.

Furnaces, Melting.
Leadite Co.
Modern Iron Works.

Garbage Cans—See Cans for Ashes and Garbage.

Garbage Wagons.
Austin-Western Road Machy. Co.
Federal Motor Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
Watson Wagon Co.
White Co., The.

Gas Engines.
Bruce-Macbeth Engine Co.
Westinghouse Electric & Mfg. Co.
Worthington Pump & Mach. Corp.

Gaskets.
Leadite Co.

Gas Meters.
General Electric Co.
Pittsburgh Meter Co.

Gasoline Pumping Engines.
Bond Co., Harold L.
Modern Iron Works.
Worthington Pump & Mach. Corp.

Gasoline Storage Tanks.
Bowser & Co., Inc., S. F.

Gates For Parks and Cemeteries
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Company.
Wright Wire Co.

Gauges—Surface, Reservoir a Special Water Works.
Clark Co., H. W.

Graders.
Adams & Co., J. D.
Austin-Western Road Machy. Co
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Graphite.
Dixon Crucible Co., Joseph.

Grass Seed.
Burpee Co., W. Atlee.
Dreer, Henry A.
Thorburn & Co., J. M.

Health and Amusement Devices
American Playground Device Co
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.
Noll Bros.

Heating Kettles.
Connery & Co., Inc.

High Pressure Hydrants.
Smith Co., A. P.

Hitching Posts.
Barnum Iron & Wire Works, E.
Casey-Hedges Co.

Hose.
Anderson Coupling & Fire Sup. C
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

House Numbers.
Baltimore Enamel & Novelty Co.
Buffalo Municipal Equipment Co

Hydrants.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Mfg. Co.
Norwood Engineering Co.
Pratt & Cady, Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
Wood & Co., R. D.

Indicator Posts.
Columbian Iron Works.
Flower-Stephens Mfg. Co.
Ludlow Valve Mfg. Co.
Pratt & Cady, Inc.
Rensselaer Valve Co.

Insulating Materials.
Carey Co., Philip.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Insulated Wire and Cable.
General Electric Co.
Simplex Wire & Cable Co.

Iron Collapsible Forms For Moulding Concrete.
Storms Mfg. Co.

Jail Cells and Jail Work.
Barnum Iron Works, E. T.

Joints, Flexible.
Coldwell-Wilcox Co.

Kahn Armour Plates.
Truscon Steel Co.

Continued on page 106

BACK OF THE PERFECT CURBING ARE KAHN CURB BARS

They provide the est and most econom- al method of pro- cting and reinforcing ncrete curbing for ther business or resi- ential streets. There no separating or litting of the con- ete at the corners, on count of the open aces in the anchorage, hich is absolutely ositive.

Kahn Curb Bars are manufactured from special rolled steel sections, and are heavily galvanized after forming. They are furnished in either straight or curved bars and provide a protection of 1⅝ inches. Standard lengths 8, 10 and 12 feet.

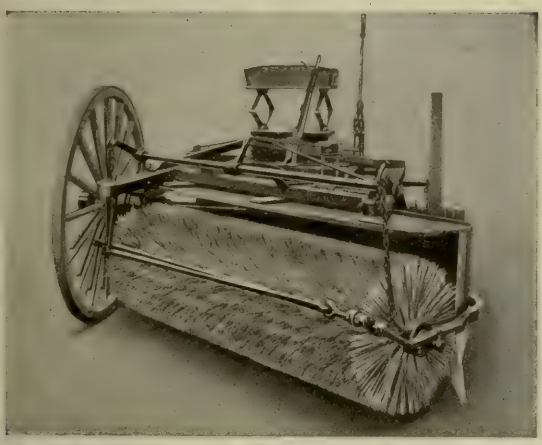
TRUSCON STEEL COMPANY

(FORMERLY TRUSSED CONCRETE STEEL CO.)

YOUNGSTOWN, OHIO.

WAREHOUSES AND REPRESENTATIVES IN PRINCIPAL CITIES

TRUSCON STEEL CO. TRUSCON BUILDING PRODUCTS



Clean Streets

In order to have and maintain clean, "dust-less" streets, the use of a strong, durable street sweeper is essential. The Reliance Sweeper has won fame throughout the contry as THE sweeper

Sweeps clean any kind of pavement. Simple in construction—simple to operate. Made of the best materials.

Effectiveness, Strength and Durability are its Main Features.

WRITE FOR ILLUSTRATED BOOKLET

THE UNIVERSAL ROAD MACHINERY CO.

KINGSTON, N. Y.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 112

Kettles, Tar and Asphalt.
Connery & Co., Inc.

Landscape Architects.
Arnold, Sheffield A.
Cole, Louis S.
Cowell, Arthur W.
Cullen, Wm. E.
Davey Tree Expert Co.
Hare & Hare.
Helder, Arthur H.
Higgins, J. Wallace.
Horvath, M. H.
Leavitt, Chas. W.
Nutter, Frank H.

Lapidolith.
Sonneborn Sons, Inc., L.

Lawn Mowers.
Austin Western Road Machy. Co.
Manufacturers Distributing Co.
Milbradt Mfg. Co.
Pennsylvania Lawn Mower Works.
Shawnee Mower Co.

Lawn Sweepers and Sprinklers.
Everwear Mfg. Co.
Pennsylvania Lawn Mower Co.
Spray Engineering Co.

Lead Furnaces & Caulking Tools.
Modern Iron Works.
Smith, A. P.
Water Works Equipment Co.

Leadite.
Leadite Co.

Lead Wool.
United Lead Co.

Leak Finders.
Clark & Co., H. W.
Modern Iron Works.
Pitometer Co.
Water Works Equipment Co.

Liquid Chlorine.
Arnold, Hoffman & Co.
Bush-Beach & Gent.
Electro Bleaching Gas Co.
Great Western Electro Chem. Co.
Pennsylvania Salt Co.
Wallace & Tiernan Co., Inc.

Lighting Standards.
Casey-Hedges Co.
Chicago Concrete Post Co.
Cutter Co., George.
Electric Railway Equipment Co.
King Foundry Co.
Mott Iron Works, J. L.
Stewart Iron Works Co.

Lubricants.
Dixon Crucible Co., Joseph.

Lungmotors.
Life Saving Devices Co.

Manhole Covers.
Barnum Iron Works, E. T.
Casey-Hedges Co.
Clark Co., H. W.
Columbian Iron Works.
East Iron & Machine Co.
Modern Iron Works.
Mott Iron Works, J. L.
S. E. T. Valve & Hydrant Co.
U. S. Cast Iron Pipe & Foundry Co.
Wood & Co., R. D.

Merry-Go-Rounds.
American Playground Device Co.
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.

Metal Preservatives.
Dixon Crucible Co., Joseph.
Harrisons, Inc.

Meter Books.
Buffalo Meter Co.
Pittsburgh Meter Co.

Meter Boxes.
Buffalo Meter Co.
Casey-Hedges Co.
Clark Co., H. W.
Columbian Iron Works.
Ford Meter Box Co.
Hersey Mfg. Co.
McNutt, Lewis
Modern Iron Works.
Pittsburgh Meter Co.
S. E. T. Valve & Hydrant Co.

Meter Couplings.
Clark Co., H. W.
Ford Meter Box Co.
McNutt, Lewis
Modern Iron Works.
Pittsburgh Meter Co.

Meter Holding Devices.
Ford Meter Box Co.
McNutt, Lewis
Modern Iron Works.

Meter Testers.
Buffalo Meter Co.
Clark Co., H. W.
Ford Meter Box Co.
Neptune Meter Co.
Pittsburgh Meter Co.

Meters—See Water and Gas Meters.

Motor Trucks.
Couple-Gear Freight-Wheel Co.
Federal Motor Truck Co.
General Motors Truck Co.
Garford Motor Truck Co.
Packard Motor Car Co.
White Co., The.

Motor Fire Apparatus—See Automobile Fire Apparatus.

Motor Truck Trailers.
Watson Wagon Co.

Municipal Auditors.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark.

Nurseries.
American Nursery Co.
Andorra Nurseries.
Bobbink & Atkins.
Donaldson Co.
Dreer, Henry A.
Harrison Nursery Co.
Hicks Nurseries.
Kohankie & Son, Henry.
Meehan Co., Thomas.
Smith Co., W. & T.
Storrs & Harrison Co.

Oil Tanks.
Connery & Co., Inc.

Ornamental Metal Fencing.
Barnum Iron & Wire Works, E. T.
Mott Iron Works Co., J. L.
Stewart Iron Works Co.
Wright Wire Co.

Packing.
Carey Co., Philip.

Paint Gun (Pneumatic).
Spray Engineering Co.

Park Management and Advice.
Benjamin E. Gage.

Park Benches.
American Playground Device Co.
Ashland Mfg. Co.
Barnum Iron & Wire Works, E. T.
Casey-Hedges Co.
Enterprise Iron Works.
Mott Iron Works, J. L.
Noll Brothers.
Stewart Iron Works Co.

Park and Lawn Sprinklers.
Penn. Lawn Mower Works.
Spray Engineering Co.

Park Swings.
Noll Brothers.

Paving Brick Information
National Paving Brick Mfrs. Assn

Paving Inspection.
Allentown Testing Laboratories.
Hunt & Co., Robt. W.

Paving Machinery and Tools.
Erie Machine Shops
Warren Bros. Co.

Paving Materials. (See also und Brick and Cement.)
Barrett Co., The.
Carey Co., Philip.
Standard Oil Co.
Warren Bros. Co.

Paving Mixers.
Warren Bros. Co.
Worthington Pump and Machine Corporation.

Paving Mixtures.
Standard Oil Co.

Pencils, Drafting, Office.
Dixon Crucible Co., Joseph.

Pipe.
American Cast Iron Pipe Co.
Casey-Hedges Co.
Cast Iron Pipe Pub. Bureau, R. C McWane, Sec.
Central Foundry Co.
Clow & Sons, James B.
Donaldson Iron Co.
Glamorgan Pipe & Foundry Co.
Lynchburg Foundry Co.
Massillon Iron & Steel Co.
U. S. Cast Iron Pipe & Foundry C
Warren Fdry. & Machine Co.
Wood & Co., R. D.
Zelnicker Supply Co., W. A.

Pipe Covering.
Carey & Co., Philip.

Pipe Cutters.
Smith Co., A. P.
Strickler & Bros., W. W.
Water Works Equipment Co.

Pipe Handling Machinery.
Taylor Portable Steel Derrick Co.

Pipe Joint Compound.
Dixon Crucible Co., Joseph.

Pipe Jointing Materials.
Leadite Co.
United Lead Co.
Water Works Equipment Co.

Pipe Locators.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co.

Pitch.
Barrett Co., The.
Carey Co., Philip.

Pitometers.
Pitometer Co., The.

Playground Apparatus.
American Playground Device Co.
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.

Pneumatic Tools.
United Lead Co.

Continued on page 108

O DELAYS FOR LOADING
WATSON TRAILERS
Set out your WATSON TRAILERS in the yard or on the job. Load or unload them without delaying your motor equipment. Trucks are away working while the gang handles the load on the trailers.
Use the full power of your motor equipment.
WATSON TRAILERS will increase the motor truck's hauling capacity as high as 400% in many cases.
Watson Trailers and Semi-Trailers are built in capacities up to 5 tons. Platform body or bottom dump. Full details on the pamphlet—"Heavy Hauling." Write for your copy.
WATSON WAGON Co
30 East Center Str.
Canastota, N.Y.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 11

Poles, Combination Railway and Lighting.
Cutter Co., George.
Electric Railway Equipment Co.
Mott Iron Works, J. L.

Police Patrols.
General Motors Truck Co.
White Co., The.

Police Signal Cables.
Simplex Wire & Cable Co.

Police Signal Systems.
Gamewell Fire Alarm Telegraph Co.

Portable Derricks.
Taylor Portable Steel Derrick Co.

Portland Cement.
Atlas Portland Cement Co.
Pennsylvania Cement Co.

Powder.
DuPont de Nemours & Co., E. I.

Producers—Gas Power Plants.
Bruce-Macbeth Engine Co.
Westinghouse Electric & Mfg. Co.

Publishers.
Appleton & Co., D.
Engineering News-Record.
Wiley & Sons, John.

Pumping Machinery.
Bond Co., Harold L.
DeLaval Steam Pump Co.
Deming Co.
Shone Co.
Wood & Co., R. D.
Worthington Pump and Mach. Corp.

Ramshorn Meter Holding Frame.
Ford Meter Box Co.

Reinforcing for Paving.
Truscon Steel Co.

Repair Lids for Service Boxes.
Clark Co., H. W.
Modern Iron Works.

Road and Street Machinery.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Baker Mfg. Co.
Buffalo-Springfield Roller Co.
Connery & Co., Inc.
Erie Machine Shops.
Garford Motor Truck Co.
The Good Roads Machinery Co.
Littleford Bros.
Newport Culvert Co.
Packard Motor Car Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.
Universal Road Machinery Co.
Warren Bros. Co.
White Co., The.

Road Binders.
Barrett Co., The.
Semet-Solvay Co.
Standard Oil Co.

Road Culverts.
Casey-Hedges Co.
Good Roads Machy. Co.
Newport Culvert Co.
Storms Mfg. Co.
U. S. Cast Iron Pipe & Fdry. Co.
Wood & Co., R. D.

Road Drag and Street Scrapers.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
The Good Roads Machinery Co.
Newport Culvert Co.
Rochester Can Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Road Oil.
Barrett Co., The.
Dustoline for Roads Co.
Standard Oil Co.

Road Oilers.
Austin-Western Road Machy. Co.
Etnyre & Co., E. D.
General Motors Truck Co.
Good Roads Machinery Co.
Universal Road Machinery Co.
White Co., The.

Road Rollers.
Austin-Western Road Machy. Co.
Buffalo Springfield Roller Co.
Erie Machine Shops.
Good Roads Machinery Co.

Rock Crushers.
Austin-Western Road Machy. Co.
Good Roads Machy. Co.
Universal Road Machinery Co.
Worthington Pump & Mach. Corp.

Roofing.
Barrett Co., The.
Carey Co., Philip.

Rubber Tires.—See Tires, Rubber.

Rubbish Burners.
Barnum Iron Works, E. T.

Rust Preventing Material.
Dixon Crucible Co., Jos.
Harrisons, Inc.

Safety Manhole Cover.
East Iron & Machine Co.

Sand Spreaders.
Buffalo Municipal Equipment Co.

Sanitary Drinking Fountains.
Barnum Iron Works.
Casey-Hedges Co.
Mott Iron Works, J. L.
Rundle-Spence Mfg. Co.
Stewart Iron Works Co.

Scarifiers.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Good Roads Machinery Co.
Newport Culvert Co.
Universal Road Machy. Co.

Seeds, Plants and Bulbs.
Burpee Co., W. Atlee.
Dreer, Henry A.
Hicks Nurseries.
Storrs & Harrison Co.
Thorburn & Co., J. M.

Service Boxes.
Casey-Hedges Co.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co.

Service Box Finders.
Clark Co., H. W.

Sewerage Disposal.
Sanitation Corporation.
Spray Engineering Co.

Sewage Ejectors.
Otterson Auto-Eductor Co.
Shone Co.

Sewer Buckets.
Champion Potato Machinery Co.

Sewer Castings.
Casey-Hedges Co.
Clark Co., H. W.
Dee Co., Wm. E.
Enterprise Iron Works.

Sewer Cleaning Apparatus.
Buffalo Municipal Equipment Co.
Champion Potato Machinery Co.
Turbine Sewer Machine Co.

Sewer Jacks.
Ashland Mfg. Co.

Sewer Pipe.
Dee Co., Wm. E.

Sewer Rods.
Bond Co., Harold L.
Champion Potato Machinery Co
Turbine Sewer Machine Co.

Sheer Gates.
Chapman Valve Mfg. Co.
Columbian Iron Works.
Rensselaer Valve Co.

Signs—Iron and Wire.
Barnum Iron Works, E. T.
Buffalo Municipal Equipment C
Early, Jos. N.
Lebanon Iron & Machine Co.
Union Iron Products Co.

Sleeves and Valves.
Flower-Stephens Mfg. Co.
Rensselaer Valve Co.

Sluice Gates and Valves.
Chapman Valve Mfg. Co.
Coldwell Wilcox Co.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Rensselaer Valve Co.

Snow Cleaning Machinery.
Good Roads Machinery Co
Russell Grader Mfg. Co.

Snow Plows.
Baker Mfg. Co.
Good Roads Machinery Co.
Newport Culvert Co.
Russell Grader Mfg. Co.

Soil Pipe (Cast Iron).
Abendroth Bros.
Alabama Pipe & Foundry Co.
American Enameling Mfg. Co.
American Foundry & Pipe Co.
Anniston Foundry Co.
Bessemer Soil Pipe Co.
Campbell Mfg. Co.
Casey-Hedges Co., The.
Central Foundry Co.
Charlotte Pipe and Foundry Co
Coosa Pipe & Foundry Co.
Crown Pipe and Foundry Co.
Gadsden Pipe Co.
Haines, Jones & Cadbury Co.
Johnson Co., J. D.
Krupp Foundry Co.
Medina Foundry Co.
National Pipe & Fdry. Co.
Reading Foundry & Supply Co.
Salem Brass & Iron Mfg. Co.
Sanitary Co. of America.
Somerville Iron Works, The.
Standard Foundry Co.
Superior Mfg. Co.
Union Foundry Co.
Weiskittel & Son Co., A.
Wetter Mfg. Co., H.

Spiral Riveted Pipe.
Casey-Hedges Co.

Spraying Machinery for Trees a Shrubs.
Deming Co.

Spray Nozzles.
Spray Engineering Co.

Continued on page 110

THE STANDARD METHOD of SURFACE TREATMENT

Below is a water bonded Gravel Road treated with Stanolind Paving Asphalt at 300°F., 45 pounds pressure, applied one-half gallon to the square yard by special pressure tank wagon shown in other illustration.

One application of Stanolind Paving Asphalt on Macadam and Gravel Roads has given three years' service with practically no expense. Builds more substantial surface at half the cost of light oil treatment for three years. Can be applied on roads previously treated with Road Oil.

Write today for free booklet, "Stanolind Paving Asphalt."

STANDARD OIL COMPANY
(INDIANA)

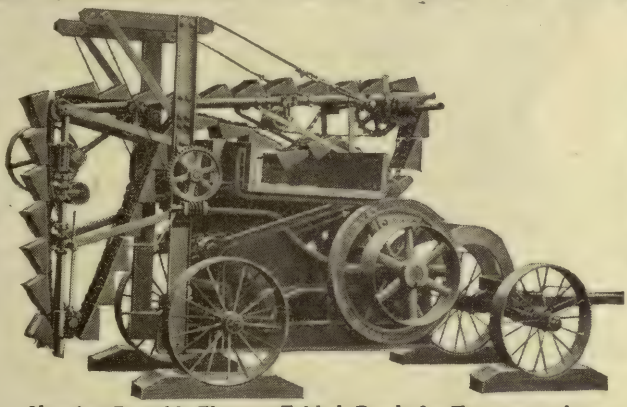
72 W. Adams Street, Chicago, Ill.

AURORA ROCK CRUSHERS

Portable and Stationary types have proved their reliability in all kinds of street and road work. Having an all steel frame and fitted with manganese steel crushing jaws when required, this crusher can handle the hardest rocks with the best results.

Its special motion of the jaw striking two blows on the stone to each revolution of the eccentric shaft gives this crusher an extra large capacity for its size.

THREE SIZES



We have added a new small size to our line for light portable work. Made in 3 sizes both portable and stationary with elevators, screens and bins to suit.

THREE SIZES

Showing Portable Elevator Folded, Ready for Transportation

Write for our general catalogue No. 18. It contains a complete description of our entire line

THE AUSTIN WESTERN ROAD MACHINERY CO., Chicago

BRANCH OFFICES

NEW YORK
DALLAS
PORTLAND, ORE.
SAN FRANCISCO
ST. PAUL
LOS ANGELES
ATLANTA
RICHMOND, VA.
COLUMBUS, O.
BOSTON
OKLAHOMA CITY
JACKSON, MISS.
MEMPHIS

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisers follows this classified list. See page 112

Standpipes.
Casey-Hedges Co.
Connery & Co., Inc.
Wood & Co., R. D.

Steel Derricks.
Taylor Portable Steel Derrick Co.

Street Cleaning Machines (Motor Driven).
Garford Motor Truck Co.
General Motors Truck Co.
White Co., The.

Street Flushers.
Buffalo Municipal Equipment Co.
Etnyre & Co., E. D.
Garford Motor Truck Co.
General Motors Truck Co.
White Co., The.

Street Lamps—Electric.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Street Lamp Posts.
Barnum Iron Works, E. T.
Casey-Hedges Co.
Chicago Concrete Post Co.
Cutter Co., George.
Electric Railway Equipment Co.
King Foundry Co.
Mott Iron Works, J. L.
Stewart Iron Works Co.

Street and Road Graders.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Good Roads Machy. Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Street and Road Signs.
Baltimore Enamel & Novelty Co.
Buffalo Municipal Equipment Co.
Early, Jos. N.
Lebanon Iron & Machine Co.
Union Iron Products Co.

Street Sign Posts.
Casey-Hedges Co.
Cutter Co., George.
Early, Jos. N.
Lebanon Iron & Machine Co.
Mott Iron Works, J. L.

Street Sprinklers.
Austin-Western Road Machy. Co.
Buffalo Municipal Equipment Co.
Etnyre & Co., E. D.
Federal Motor Truck Co.
Garford Motor Truck Co.
General Motors Truck Co.
Water Works Equipment Co.
White Co., The.

Street Sweepers.
Austin-Western Road Machy. Co.
Universal Road Machinery Co.

Street Trash Cans.
American Can Co.
Butler Mfg. Co.
Rochester Can Co.

Surveyors Instruments.
Buff & Buff Co.
Kolesch & Co.

Tanks, Storage for Oils and Gasoline.
Bowser & Co., Inc., S. F.
Connery & Co., Inc.

Tanks and Towers.
Casey-Hedges Co.
Newport Culvert Co.
Wood & Co., R. D.
Zelnicker Supply Co., W. A.

Tapping Machines.
Smith Co., A. P.
Water Works Equipment Co.

Tar.
Barrett Co., The.

Tar & Asphalt Spreaders.
White Co., The.

Tar Kettles.
Casey-Hedges Co.
Connery & Co., Inc.
Good Roads Machinery Co.
Littleford Bros.
Warren Bros. Co.

Tar Wagons.
Casey-Hedges Co.

Tarvia.
Barrett Co., The.

Testing Laboratories.
Allentown Testing Laboratory Co.
Hunt & Co., Robt. W.

Tires, Rubber.
Dayton Rubber Mfg. Co.
Firestone Tire & Rubber Co.
Fisk Rubber Co.
Goodrich Co., B. F.
Republic Rubber Corp.
U. S. Tire Co.

Traction Engines.
Buffalo Springfield Roller Co.

Traction Trains.
Buffalo Springfield Roller Co.

Tractors.
American-La France Fire Engine Co.
Garford Motor Truck Co.
General Motors Truck Co.
Watson Wagon Co.
White Co., The.

Traffic Posts.
Buffalo Municipal Equipment Co.
Chicago Concrete Post Co.
George Cutter Co.
Lebanon Iron & Machine Co.

Traffic Regulation Signs.
Baltimore Enamel & Novelty Co.
Buffalo Municipal Equipment Co.
Early, Jos N.
Lebanon Iron & Machine Co.
Union Iron Products Co.

Trailers.
Buffalo Springfield Roller Co.
Watson Wagon Co.

Tree and Flower Bed Guards.
Mott Iron Works, J. L.
Wright Wire Co.

Trench Braces.
Bond Co., Harold L.

Trench Pumps.
Bond Co., Harold L.
Deming Co.
Modern Iron Works.
Water Works Equipment Co.
Worthington Pump & Mach. Corp.

Turbines.
DeLaval Steam Pump Co.
Westinghouse Electric & Mfg. Co.

Vacuum Pumps.
Deming Co.
Worthington Pump & Mach. Corp.

Valves.
Ashland Mfg. Co.
Chapman Valve Mfg. Co.
Coldwell-Wilcox Co.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Pratt & Cady Co., Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
Water Works Equipment Co.
Wood & Co., R. D.

Valve Boxes and Housings.
Casey-Hedges Co.
Clark Co., H. W.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Modern Iron Works.
Pratt & Cady Co., Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
U. S. Cast Iron Pipe & Foundry Co.
Wood & Co., R. D.

Valve Inserting Machinery.
Smith Co., A. P.

Valve Seats.
Wood & Co., R. D.

Valve Specialties.
Chapman Valve Mfg. Co.
S. E. T. Valve & Hydrant Co.

Wagons and Carts.
Watson Wagon Co.

Water Works Conservation.
National Water Main Cleaning Co.
Pitometer Co.
Water Works Equipment Co.

Water Main Cleaning.
National Water Main Cleaning Co.

Water Meters.
Badger Meter Mfg. Co.
Buffalo Meter Co.
General Electric Co.
Hersey Mfg. Co.
Neptune Meter Co.
Pittsburgh Meter Co.
Thomson Meter Co.
Union Water Meter Co.
Worthington Pump & Mach. Corp.

Waterproofing.
Barrett Mfg. Co.
Carey Co., Philip.
Minwax Co.
Sonneborn Sons, Inc., L.
Truscon Steel Co.

Water Purification Chemicals.
See Chemicals for Water Purification.

Water Regulators.
Modern Iron Works.
Union Water Meter Co.

Water Towers.
Casey-Hedges Co.

Water Works Specialties.
Casey-Hedges Co.
Chapman Valve Mfg. Co.
Clark Co., H. W.
DeLaval Steam Pump Co.
Flower-Stephens Mfg. Co.
Leadite Co.
Minwax Co.
Modern Iron Works.
Pittsburgh Filter Co.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
Strickler & Bros., W. W.
Union Water Meter Co.
United Lead Co.
Warren Fdry. & Machine Co.
Water Works Equipment Co.

Well Construction & Equipment
Clark Co., H. W.

Wheel Scrapers.
Adams & Co., J. D.
Austin-Western Road Machy. Co.
Good Roads Machinery Co.

Wire and Cable.
General Electric Co.
Simplex Wire & Cable Co.

Wire-Cut-Lug Brick.
Metropolitan Paving Brick Co.
Southern Clay Mfg. Co.

Wood Preservatives.
Barrett Co., The.
Republic Creosoting Co.

PENNSYLVANIA
Quality
LAWN MOWERS

Lawn mower blades must be sharp *all the time* to cut clean and easily—like razor blades they drag and chop when dull.

Only "PENNSYLVANIA" *Quality* Lawn Mowers use crucible tool steel (oil-hardened and water-tempered, in *all* blades)—steel which takes and keeps an edge. Being self-sharpening they are *all* sharp *all* the time.

PENNSYLVANIA LAWN MOWER WORKS, Philadelphia

Sold by Hardware Dealers and Seedsmen

FREE—A booklet, "How to Care for the Lawn"—written by an authority—mailed on request.

Index to Advertisers in this Issue of The American City

Abendroth Bros. 25
Adams & Co., J. D. 97
Alabama Pipe & Foundry Co. 25
Albright & Mebus 89
Allentown Testing Laboratory Co. 89
Alvord, J. W., & C. B. Burdick 89
American Can Co. 60
American Cast Iron Pipe Co. 24
American City Bureau 75
American Enameling Mfg. Corp. 25
American Foundry & Pipe Co. 25
American-LaFrance Fire Eng. Co. 52
American Nursery Co. 86
American Playground Device Co. 70
Anderson Coup. & Fire Supply Co. 57
Andorra Nurseries 88
Anniston Foundry Co. 25
Appleton & Co., D. 81
Arnold, Hoffman & Co. 34
Arnold, Sheffield, A. 89
Arnold & Tripp 89
Ashland Mfg. Co. 73
Atlas Portland Cement Co. 98
Austin Western Road Mach'y Co. 109

Badger Meter Mfg. Co. 16
Baker Co., R. D. 93
Baker Mfg. Co. 91
Ballard & Co., F. W. 91
Baltimore Enamel & Novelty Co. 65
Barnes Co., A. S. 80
Barnum Iron Works, E. T. 80
Barrett Co., The 45
Bessemer Soil Pipe Co. 25
Bi-Lateral Fire Hose Co. 56
Black & Veatch 89
Blanchard, Arthur H. 89
Bobbink & Atkins 86
Bond Co., Harold L. 62
Bowser & Co., Inc., S. F. 55
Bruce-Macbeth Engine Co. 61
Buff & Buff Mfg. Co. 95
Buffalo Meter Co. 36
Buffalo Municipal Equip. Co. 61
Buffalo Springfield Roller Co. 94
Bureau of Municipal Research 64
Burns & McDonnell 89
Burpee & Co., W. Atlee 85
Bush-Beach-Gent 24
Butler Mfg. Co. 84

Caird, James M. 89
Campbell Mfg. Co. 25
Carey Co., Philip 4-5
Casey-Hedges Co. 76
Cast Iron Pipe Pub. Bureau 12-13
Central Foundry Co. 23-25
Champion Potato Machinery Co. 14
Chapman Valve Mfg. Co. 22
Charlotte Pipe and Foundry Co. 25
Chester & Fleming 89
Chicago Concrete Post Co. 58
Clark Co., H. W. 36
Coldwell-Wilcox Co. 30
Cole, L. S. 89
Columbian Iron Works Co. 35
Connery & Co., Inc. 96
Coosa Pipe & Foundry Co. 25
Couple-Gear Freight Wheel Co. 57
Cravath, J. R. 89
Crown Pipe & Foundry Co. 25
Cullen, Wm. F. 89
Cutter, Geo., Co. 113

Davey Tree Expert Co. 87
Dayton Rubber Mfg. Co. 56
Dee Co., Wm. E. 24
De Laval Steam Pump Co. 61
Deming Co., The 31
Dixon Crucible Co., Joseph 91
Donaldson Co. (Willadean Nurs.) 86
Dreer, Henry A. 87
Duluth Engineering Co. 89
Dunham-Clarin Co., F. A. 89
Du Pont Powder Co. 92
Dustoline for Roads Co. 88

Early, Jos. N. 62
East Iron & Machine Co. 36
Economy Drawing Table Co. 68
Eddy Valve Co. 35

Eggert Chemical Co. 68
Electric Ozone Sterilizer Co. 14
Electric Railway Equipment Co. 43
Electro Bleaching Gas Co. 32
Engineering News-Record 40
Enterprise Iron Works 87
Erie Machine Shops 94
Etnyre & Co., E. D. 94
Everwear Mfg. Co. 8-9

Fabric Fire Hose Co. 53
Federal Motor Truck Co. 49
Fibre Conduit Co. 91
Firestone Tire & Rubber Co. 51
Fisk Rubber Co. 46
Flood, Walter H. 89
Flower-Stephens Mfg. Co. 27
Foos Gas Engine Co. 14
Ford Meter Box Co. 21
Framingham Nursery Co. 86
Fuller & McClintock 89

Gadsden Pipe Co. 25
Gage, Benj. E. 77
Gamewell Fire Alarm T. Co. 57
Gannett, Seelye & Fleming 89
Garford Motor Truck Co. 48
General Electric Co. 2-74
General Motors Truck Co. 47
George, Howard 64
Goodrich Rubber Co., B. F. 6-7
Good Roads Mach'y Co. 103
Great Western Electro Chem. Co 24
Greeley, Samuel A. 89
Gregory, John H. 89

Haines, Jones & Cadbury Co. 25
Hansen, A. E. 89
Harding, James 90
Hare & Hare 90
Harrison Nursery Co. 87
Hazen, Whipple & Fuller 90
Helder, Arthur H. 90
Hering, Rudolph 90
Hersey Manufacturing Co. 34
Hicks Nurseries 84
Higgins, J. Wallace 90
Hill-Standard Co. 72
Hopkins, Chas. C. 90
Horvath, M. B. 90
Hunt & Co., Robert W. 91

Jacobs J. L. 90
Jaeger Machine Co. 93
Jennings, Lawrence & Lindsey 90
Johnson Co., J. D. 25
Johnson, Geo. A. 90

King Foundry Co. 62
Knowles, H. C. 90
Kohankie & Son, Henry 87
Kolesch & Co. 95
Krupp Foundry Co. 25

Leadite Co., The 35
Leavitt, Chas. W. 90
Lebanon Machine Co. 62
Lewis & Valentine 87
Life Saving Devices Co. 57
Littleford Bros. 95
Loper Fire Alarm Co. 57
Ludlow, J. L. 90
Ludlow Valve Mfg. Co. 34
Lynchburg Foundry Co. 24

McNutt, Lewis 64
Manufacturers Dist. Co. 63
Marchant Calculating Mach. Co. 66
Martinique Hotel 80
Medart Mfg. Co., Fred 70
Medina Foundry Co. 25
Meehan Co., Thos. B. 85
Meehan, Thos., & Sons 90
Metropolitan Pav. Brick Co., The 62
Milbradt Mfg. Co. 66
Minwax Co. 36
Mitchell, Hugh C. 90
Modern Iron Works 34
Mott Iron Works, J. L. 66

National Paving Brick Mfrs. Assn. 63
National Pipe & Foundry Co. 25
National Water Main Cleaning Co. 18

Neptune Meter Co. 10-11
Newport Culvert Co. 101
N.Y. Contin'l Jewell Filtration Co. 59
Noiseless Typewriter Co. 82
Noll Bros. 83
Norwood Engineering Co. 39
Nutter, Frank H. 90

Otterson Auto-Eductor Co. 44

Packard Motor Car Co. 50
Pennsylvania Cement Co. 96
Penn. Lawn Mower Works 111
Pennsylvania Salt Mfg. Co. 29
Pioneer Asphalt Co. 68
Pitometer Co. 20
Pittsburgh Filter Mfg. Co. 33
Pittsburgh Meter Co. 61
Pollock & Taber 90
Potter, Alexander 90
Potts, Clyde 90
Pratt & Cady Co., Inc 24
Puro Sanitary Drinking Foun. Co. 76

Reading Foundry & Supply Co. 25
Rensselaer Valve Co. 14
Republic Creosoting Co. 91
Republic Rubber Corporation 54
Rigamount, Victor A. 90
Rochester Can Co. 83
Rundle-Spence Mfg. Co. 77
Russell Grader Mfg. Co. 95

Salem Brass & Iron Mfg. Co. 25
Sanitary Co. of America 25
Sanitation Corporation 25
Scofield Engineering Co. 114
Semet-Solvay Co. 97
S. E. T. Valve & Hydrant Co. 38
Shawnee Mower Co. 84
Sherman, LeRoy K. 90
Shone Co. 35
Simplex Wire & Cable Co. 79
Smith Co., A. P. 37
Smith Co., W. & T. 87
Somerville Iron Works, The 25
Sonneborn Sons, Inc., L. 76-77
Southern Clay Mfg. Co. 94
Spaulding Mfg. Co. 53
Spray Engineering Co. 77
Standard Foundry Co. 25
Standard Oil Co. 109
Stander, Louis E. 90
Stewart Iron Works Co. 84
Storms Mfg. Co. 94
Storrs & Harrison Co. 85
Strickler & Bros., W. W. 36
Superior Mfg. Co. 25
Survey, The 88

Taylor, Henry W. 91
Taylor Portable Steel Derrick Co. 93
Thomson Meter Co. 37
Thorburn & Co., J. M. 85
Truscon Steel Co. 105
Turbine Sewer Mch. Co. 37
Twogood, L. Scott 90

Union Foundry Co. 25
Union Iron Products Co. 62
Union Water Meter Co. 26
United Lead Co. 35
U. S. Cast Iron Pipe & Fdy. Co. 3
United States Tire Co. 56
Universal Road Machinery Co. 105

Waddell & Son 91
Wallace & Tiernan Co., Inc 15
Warren Engineering Co. 90
Warren Bros. Co. 96
Warren Foundry & Machine Co. 14
Water Works Equipment Co. 38
Watson Wagon Co. 107
Weiskittel & Son Co., A. 25
Westinghouse Elec. & Mfg. Co. 99
Wetter Mfg. Co., H. 25
White Co., The 42
Wiley & Sons, John 78
Wolff, Mark 91
Wood & Co., R. D. 28
Worthington Pump & Mch. Corp. 17
Wright Wire Co. 73

Zelnicker Supply Co., W. A. 80

CUTTER

The Daylight Saving Plan Puts Off Darkness One Hour

Then, as the sunlight finally fades away, the lighting systems in hundreds of cities flash on—brightening streets and boulevards—driving away darkness, and helping the police to prevent crime.

Cutter Standards

Are helping to establish artificial daylight in many cities, thus reducing both accidents and crime.

Our posts are built from experience gained thru twenty-five years' serving the public in cities thruout the country. We have been building the very highest quality of lighting fixtures and giving, always, adequate service.

An Engineering Department has been installed to further assist you in planning for better lighting in your city. We will be glad to give you help gratis.

Write for our new catalog showing our latest designs for High Efficiency Mazda Lamps.

GEORGE CUTTER COMPANY

413 Notre Dame St., South Bend, Ind.

SCOFIELD ENGINEERING COMPANY

PHILADELPHIA

Consulting Engineers

AN organization of thoroughly trained experts with a wide successful experience.

PUMPING STATION FOR DRY DOCK, U. S. NAVY, LEAGUE ISLAND, PHILA.

MUNICIPAL WATER WORKS AND ELECTRIC SUB-STATION CITY OF JACKSONVILLE, FLA.

WATER, FIRE AND POWER STATION CITY OF LAKELAND, FLA.

MUNICIPAL IMPROVEMENTS

Sewerage, Water Works, Electric Systems, Streets.

PUBLIC SERVICE PROPERTIES

Railway

Electric, Gas, Water, Hydraulic

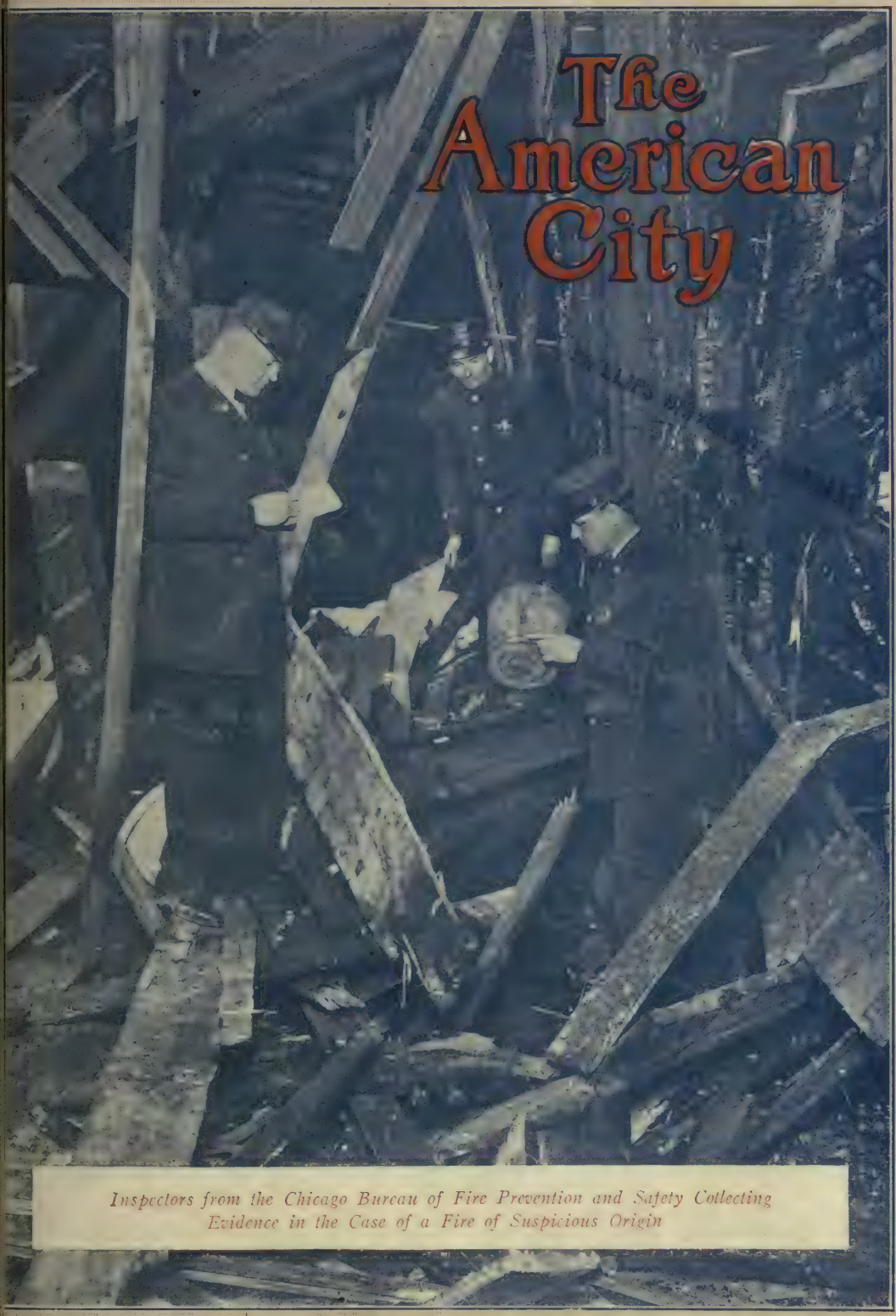
INDUSTRIAL AND TEXTILE PLANTS

REFRIGERATION

Ice and Cold Storage Plants

June, 1918
Cents $3 a Year
Publication Office:
Tribune Building, New York

The American City



Inspectors from the Chicago Bureau of Fire Prevention and Safety Collecting Evidence in the Case of a Fire of Suspicious Origin

The Investigation of Fires Before the Evidence is Destroyed is of Particular Importance in These Times of Rumored Pro-German Incendiarism. Losses by Fire in the United States in 1917 Aggregated $250,753,640, Exceeding Any Year Since 1875, with the Exception of 1906, the Year of the San Francisco Fire

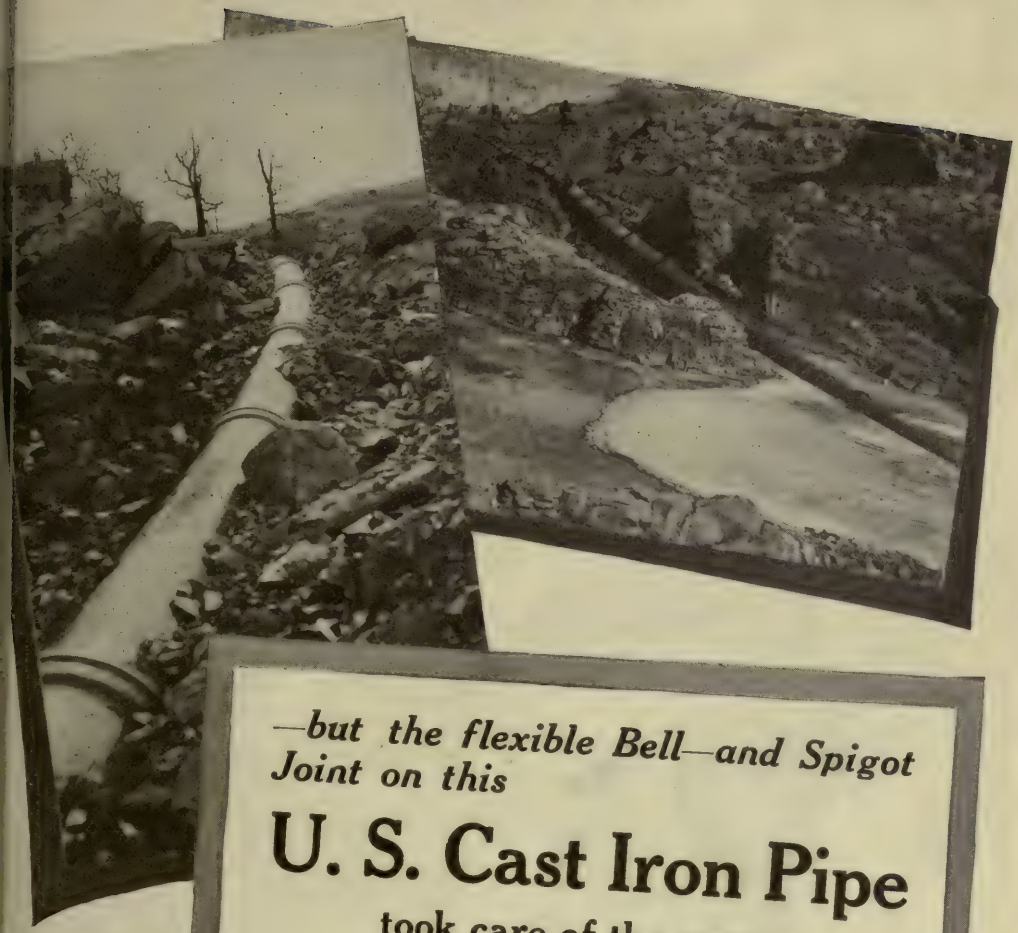
"Not the name of a thing, but the mark of a service"

MAZDA

MAZDA Service —a systematic research for making lamps more economical

THE MEANING OF MAZDA—MAZDA is the trademark of a world-wide service to certain lamp manufacturers. Its purpose is to collect and select scientific and practical information concerning progress and developments in the art of incandescent lamp manufacturing and to distribute this information to the companies entitled to receive this Service. MAZDA Service is centered in the Research Laboratories of the General Electric Company at Schenectady. The mark MAZDA can appear only on lamps which meet the standards of MAZDA Service. It is thus an assurance of quality. This trademark is the property of the General Electric Company.

RESEARCH LABORATORIES OF GENERAL ELECTRIC COMPANY



—but the flexible Bell—and Spigot Joint on this

U. S. Cast Iron Pipe

took care of the curves

Over the rocks, around abrupt curves, down 20 feet into water, then up to the surface, then down again like the fabled sea serpent ran the 30,000-ft. Cast-Iron Pipe Line through Medicine Canyon, Oklahoma—but out of 2500 joints only THREE showed any signs of leakage. This is EVIDENCE for you. This proves the superiority of the bell-and-spigot joint, the joint poured with lead and with no machine surfaces to become corroded while it's "lying around." Do we need to offer proof of Cast-Iron Pipe SERVICE? Let 250 years answer you!

United States Cast Iron Pipe and Foundry Co.

700 E. Pearl St., Burlington, New Jersey

SALES OFFICES:

Philadelphia—1421 Chestnut St.
Pittsburgh—Henry W. Oliver Building
New York—71 Broadway
Chicago—122 South Michigan Boulevard
St. Louis—Security Bldg.
Birmingham, Ala.—American Trust Building
San Francisco—Monadnock Building
Buffalo—957 East Ferry St.
Cleveland—1150 E. 76th St. N. E.
Minneapolis — Plymouth Bldg.

For Index to Advertisements see Page 98
For Classified List of Advertisers see Page 88

Extremes of Heat and Cold

The three concrete roads shown on the opposite page are subject to the extremes of high altitude and low altitude; high temperature and low temperature.

Severe heat will not cause them to buckle, nor will severe cold crack them.

They are protected with ELASTITE EXPANSION JOINTS which take care of expansion and contraction.

Protects roads in any climate

THESE roads prove the point. The road at the left runs through Cajon pass between the Sierra Madre and San Bernardino mountains in southern California. High altitude—dry eleven months—very wet the twelfth—temperatures 10° above to 120° above zero.

The road in the center runs from Snohomish to Everett, Washington, subjected to extreme northern temperatures.

At the right is the road through the Antelope valley, a portion of the great Mojave desert of southern California. Here temperatures range from Zero to 135°.

All these roads are concrete surfaced and protected against expansion by Elastite Expansion Joint placed about every 25 feet.

Elastite is composed of a thick layer of asphalt compound sandwiched between two layers of asphalt saturated felt. It does not melt under scorching suns or become brittle in zero temperatures.

It remains elastic year after year, always maintains a frost tight seal and wears as long as the road itself.

It comes to the job in strips which one man can easily lay, keeping ahead of the pavers.

Write for samples, prices, and engineering testimony as to the efficiency of ELASTITE as proved in notable installations.

THE PHILIP CAREY COMPANY
8 Wayne Avenue, Lockland Cincinnati, Ohio

The Significance of Extra Tread Rubbe

THE thousands of "change overs" from solid tires of other makes to Goodrich De Luxe have been attributed to just one thing—the exceptional advantages afforded by THE EXTRA TREAD RUBBER in De Luxe.

The scientific distribution of *more* rubber on the tread at the point of contact with the road means a *greater margin of safety for the motor truck—more rubber to wear through.* Thus it becomes an economical proposition.

But in the protection of the mechanism and working parts of the truck itself De Luxe attains its real significance. Its GREATER CUSHION is of such volume as *to smother within the rubber itself* those strains and jars that penetrate *thinner* tires and reach the truck's mechanism.

And on a straight mileage basis De Luxe *must outwear other makes* because of its GREATER VOLUME OF RUBBER.

You want economy in operation. You want a big return from your truck investment. De Luxe will give it to you. (Made in 4, 5, 6, 7, 8 and 10-inch widths.)

Extra Tread Rubber—
Your Guarantee of
Uninterrupted Service

Branches and distributors in all truck centers

THE B.F. GOODRICH RUBBER COMPANY

The City of Goodrich—
AKRON, OHIO

GOODRICH DE LUXE TRUCK TIRES

Reduce Risks

MANY Hose buyers unknowingly take big chances when they buy Fire Hose mainly by test of jacket strength. The heart of the hose is the inner tube. If the heart is bad the body is bad.

GOODRICH "White King" Fire Hose has an inner tube of unsurpassed endurance. It is elastic, tough and age-resisting. It withstands heavy pressure longer without buckling, and permits many foldings. It will not weaken under excessive bending. It will not crack and will not burst when property and lives hang in the balance.

These are some of the reasons why "White King" holds its own with any other Fire Hose on the market. Specify it on your next buy.

THE B.F. GOODRICH RUBBER COMPANY

Makers of the Celebrated Goodrich Automobile Tires—
"Best in the Long Run"

The City of Goodrich

AKRON, OHIO

W. S. S.

A Purchased Thrift Stamp is a Soldier's Life Insurance Policy

On Sale at all Goodrich Branches

GOODRICH
"WHITE KING"
FIRE HOSE

EVERWEAR
STANDS WEAR AND TEAR

CHILDREN HAVEN'T CHANGED

Do you remember years ago when you were a kid and you used to "see-saw" on the back lot? Wasn't it great sport? Well, the children of today are the same. They like to be out in the open air and have lots of fun. But most of those empty lots are all built up now and the only place the children can play is in the street. To play on the street is dangerous with all those fast running vehicles moving to and fro, and therefore cities with modern ideas have built and equipped public playgrounds. The kids in these municipalities are fortunate to have a safe place in which to play under proper supervision. You can easily do as much for your town. Build at least one playground and make the children happy.

Catalog J. 6 tells "How and What to Do."

THE EVERWEAR MFG. CO.
SPRINGFIELD OHIO

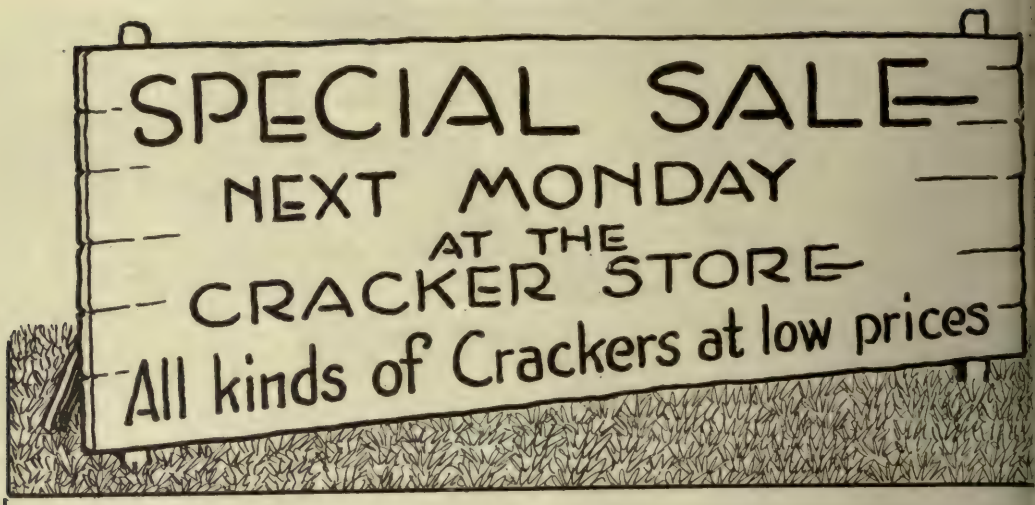
EVERWEAR
STANDS WEAR AND TEAR

PLAYGROUNDS AN EXPENSE?

Playgrounds are an expense if you do not equip them properly—that is if you install poor quality apparatus. You know, there isn't anybody giving anything away for nothing. If you pay nothing you get nothing; if you pay little you get little, and so it goes. Therefore it is much better and wiser to pay a little more at the start and get good value for your money. Many cities have found that EVERWEAR APPARATUS is the *quality* apparatus. It is strong, sane, safe and durable and up-to-date. With Everwear apparatus the children are safe and you are safe.

Send us a memorandum of your ground space and we will gladly submit plans for a model playground—no obligation.

THE EVERWEAR MFG. CO.
SPRINGFIELD OHIO



Price *Is* a Consideration

under certain circumstances.

If one store sells a box of Uneeda Biscuit for less than what another store charges, you of course conserve your cash balance by buying at the lower price. You are getting the *same* article and also saving some money. But when you need a new suit of clothes, you do not walk along the street and pick out the store which has the lowest price suit in the window.

But what has all this to do with water meters? A great deal—because some cities have allowed themselves to become so excessively sensitive on the question of "economy" that the initial price of anything seems to be the first consideration.

NEPTUNE METER COMPANY
50 EAST 42nd STREET, NEW YORK
CHICAGO · BOSTON · SANFRANCISCO
ATLANTA · LOS ANGELES · PORTLAND · SEATTLE
CINCINNATI

Price Should Be the *Last* Consideration

when it comes to purchasing water meters because the better quality, higher in price Trident Meter will be making money for you years after the time when an inferior meter would be peacefully reposing in the scrap heap.

Thousands of the Trident Meters built twenty to twenty-five years ago have served constantly with a minimum of repairs. Probably a good many of them will be on the job twenty-five years from now.

If you would like to receive some very interesting booklets about water waste prevention through the use of meters, let us have your address.

NEPTUNE METER COMPANY
50 EAST 42nd STREET, NEW YORK
CHICAGO · BOSTON · SAN FRANCISCO
ATLANTA · LOS ANGELES · PORTLAND · SEATTLE
CINCINNATI

Their great-grand to see the end of

CAST IRON PIPE

Over in Philadelphia scores of men have recently stopped on the streets to see workmen taking out a line of 30-in. Cast Iron Pipe where their grandsires had stopped to see other workmen putting it in the ground nearly 70 years ago.

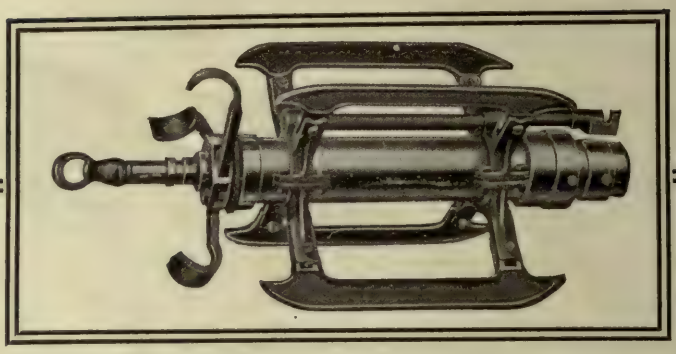
This pipe is not being removed because it is worn or rusted or rotted out—it is in perfect condition—but pumping station changes necessitated its abandonment and it is being relaid in nearby streets to serve another 70 years or longer.

The taxpayers of Philadelphia have been fortunate in having always had as water-supply engineers men of sound judgment, who were willing to profit by the experience of their professional brethren for the past two and a quarter centuries.

The Cast Iron Pipe Publicity Bureau

1 Broadway, New York City

children will not live the Service-life of that



Are Your Sewers Clean or Dirty?

Clogged Sewers Are a Menace and Should Be Attended To

Filth-laden sewers are ideal breeding places for a thousand and one kinds of disease germs. The people living in towns or cities where this condition prevails are always in danger of an epidemic, not to mention the suffering caused by frequent foul odors which belch forth from these sewers.

If your city has "sewer trouble" the quickest way to get rid of it is to have them cleaned.

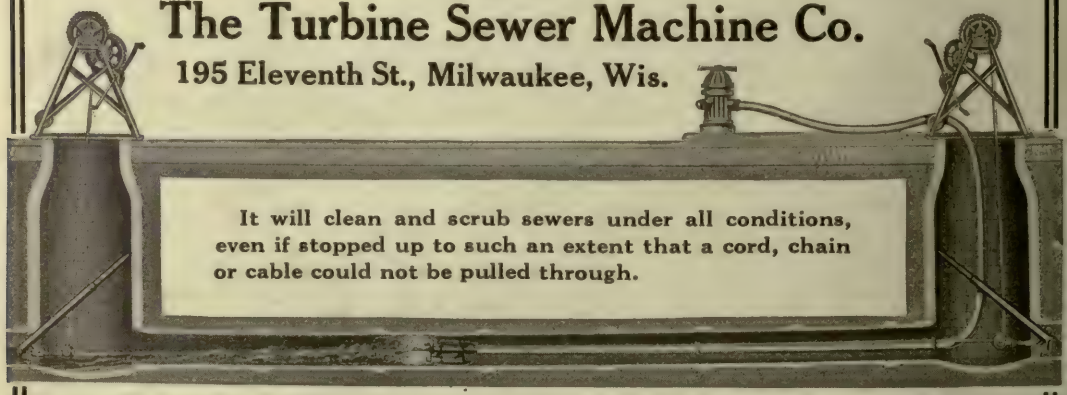
The most economical and most practical method of cleaning sewers is the TURBINE SYSTEM.

TURBINE SEWER MACHINERY cleans any size sewer from six to thirty inches in diameter. It cleans out all the rags, cinders, dirt and any other foreign matter at an extremely low cost.

Write for our free booklet on Sewer Cleaning Equipment.

The Turbine Sewer Machine Co.

195 Eleventh St., Milwaukee, Wis.



Perfect Ventilating

Westinghouse Constant-Current Regulator

The Only Type of perfectly ventilated-coil Mazda Lamp Regulator on the market.

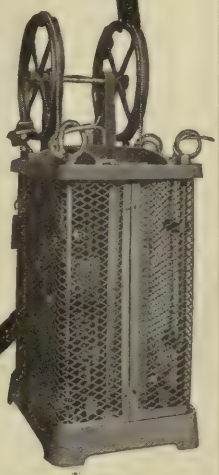
The Only Type of regulator which maintains actual constant current under all line conditions of double grounds and short circuits.

The Only Type of regulator which maintains actual constant current with variable primary voltage.

No section of the coil is over half-inch thick.

No hot spots possible.—No taping necessary.

Wire exposed directly to air.—Screens enclose all live parts.



Catalogue 7-A gives details.

Westinghouse Electric & Manufacturing Co.

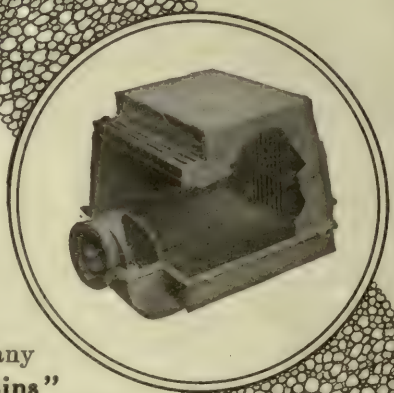
East Pittsburgh, Pa.

W WESTINGHOUSE ELECTRIC

Westinghouse

Odorless Sewer Basins
For Perfect City Sanitation

The upper picture shows a familiar sight in many city streets. The accumulated filth which has been collecting in the brick sewer basin for weeks besides endangering public health, creates much annoyance and inconvenience to the people in the immediate vicinity. But it is not during the cleaning process alone that the public health is endangered. During the weeks this sewage has been gathering continuously steeped in drain water from the street, it has been emitting its ill-smelling and disease-spreading vapors unhindered.



"ODORLESS SEWER BASIN" SIMPLICITY is shown in the lower illustration.

It can be installed by any laborer. It can be moved easily when alterations to grade or width of streets are necessary. The old style basin would be a complete loss under such conditions. One man can clean with a long-handled shovel, as many **"Odorless Sewer Basins"** in a day as two men together could clean of the old style basins in five days. This means economy in two directions: Better public health and a saving of labor that is vital when the present labor shortage is considered.

Write for our printed matter. It shows why your city should install Odorless Sewer Basins.

ODORLESS SEWER BASIN COMPANY

15 Wick Ave. Youngstown, Ohio

These Cities

have just ordered

"W & T" APPARATUS

(The Standard Chlorinator)

to control and apply

Liquid Chlorine

to their Water Supplies

Safe Water = Sterilized Water. Sterilized Water = Water + Liquid Chlorine + "W & T" Apparatus to control it.

Your City Needs Safe Water

May we not send you full details of the STANDARD Chlorinator and the 100% efficient Sterilizing Agent?

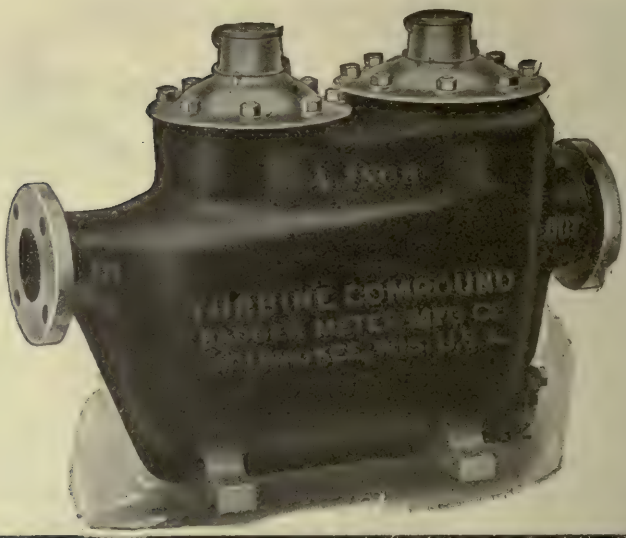
WALLACE & TIERNAN CO., Inc.

137 Centre Street, New York

PEOPLE'S GAS BUILDING, CHICAGO, ILL.

Canadian Representatives: The General Supply Co., of Canada, Ottawa, Montreal, Toronto, Winnipeg.

Pacific Coast Representative: Kenneth Shibley, Merchants Exchange Building, San Francisco, Cal.



THE BADGER METER

Gives Most Service and Least Trouble

The water meter that will keep accurate records and give the most service with little trouble and maintenance expense is the Badger Meter.

Perfect workmanship and excellent finish are characteristic of all Badger Meters.

Every Badger Meter is carefully tested by actual operation before it is sent forth with our binding guarantee for accuracy.

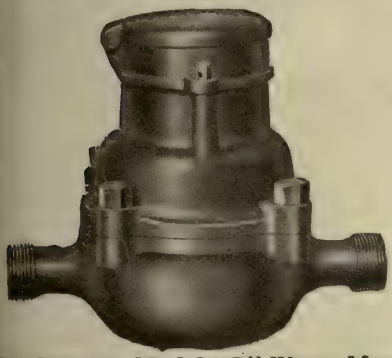
No test is considered satisfactory until the meter has properly recorded on both large and small flows.

Upon receipt of your name and address, a neat little booklet on water meters will be sent you free.

The Badger Meter Mfg. Co.
MILWAUKEE, WIS.

WORTHINGTON

a big line to choose from—a safe line to choose

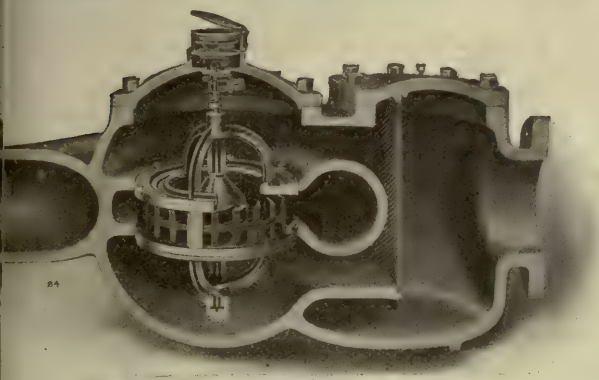


Worthington Model "G" Water Meter

METERS

Stop waste of water

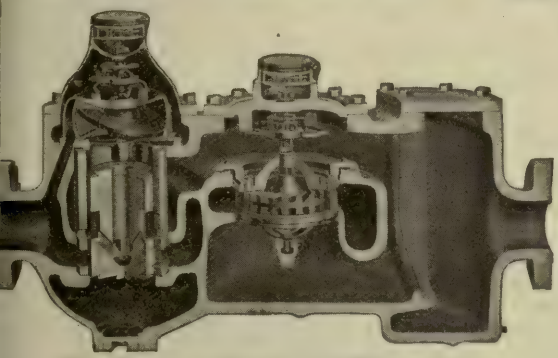
To use water carefully and economically in times of peace is wisdom—in war time—now, it is a national necessity. Stop the waste and you stop unnecessary pumping, the waste of steam, labor, coal, handling and transportation, releasing men and material that the government needs.



Section Through 6-Inch Size
Worthington Turbine Water Meter

WORTHINGTON PUMP AND MACHINERY CORPORATION

NEW YORK OFFICE: 115 BROADWAY
WORKS: HARRISON, N. J.
Branch Offices in All Principal Cities I 68.8



Worthington Compound Water Meter

METERS
DEEP WELL PUMPS
CENTRIFUGAL AND DIRECT-ACTING WATER WORKS PUMPS

WATER WORKS EQUIPMENT

DON'T WORRY ABOUT YOUR WATER WORKS EXPENSES

We Can Help You Cut Them Down!

It has been found that clogged mains create a large unnecessary expense. Clogged mains require more pressure and more pressure requires more coal and more coal requires more money, etc.

You can get rid of this condition by having your mains cleaned. It doesn't cost much, especially when you employ

The National Method

Most cities have found that The National Method of cleaning mains is the simplest, quickest and cheapest. The mains are "cleaned and scoured" and restored to their normal capacity. Scores of cities have had and are having their mains cleaned in order that they may get a stronger pressure and at the same time effect a saving running into thousands of dollars annually.

Write for free book "The Cleaning of a Water Main." It shows you how to cut down your water works cost.

National Water Main Cleaning Co.

Hudson Terminal Building

NEW YORK CITY

A water famine averted by 35,000 feet of Universal Cast Iron Pipe—14,400 feet submerged—at Puerto Barrios, Guatemala.

WRENCHES
The Only
Equipment

No Calking — Packing — Gaskets

UNIVERSAL CAST IRON PIPE

THE nearest available source of water was a mountain stream 7½ miles distant by land or 5½ miles by another route, part of which crossed a bay 24 feet deep and with a bottom of ooze. Using this route meant a submerged line of about 15,000 feet and it was chosen "after investigation showed the Universal Joint was adapted for continuous submerged pipe laying."

Universal Pipe with the Universal Joint is adapted to *any service* and can be laid *anywhere—at any time—under any conditions.*

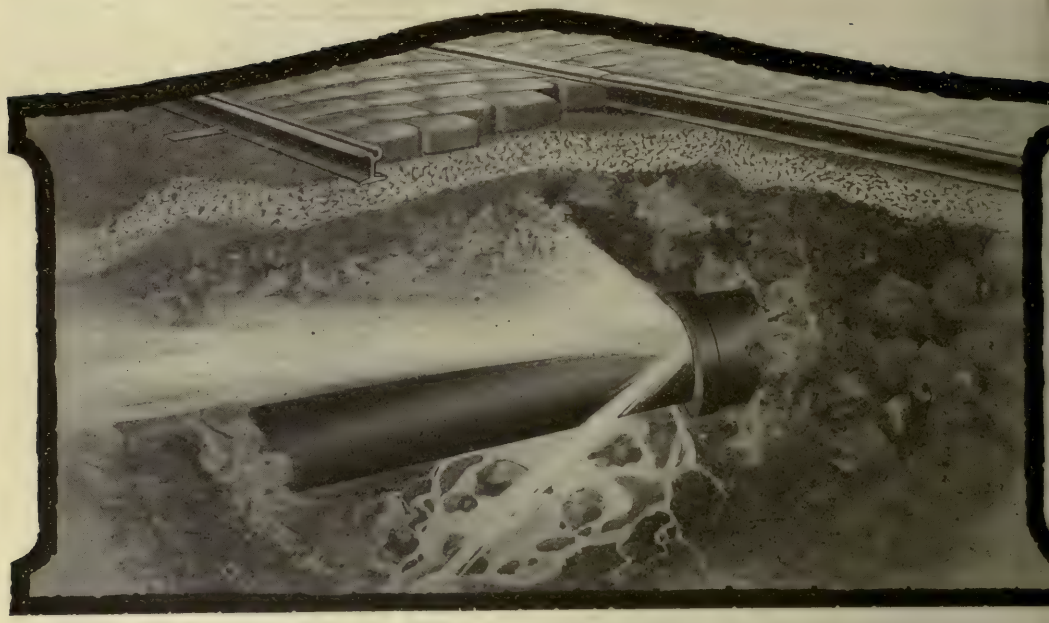
Specify Universal
"The Cast Iron Pipe That's Different"

Send for handy pocket manual and illustrated literature.

U 270

THE CENTRAL FOUNDRY COMPANY 90 WEST STREET NEW YORK

SALES OFFICES:—NEW YORK, CHICAGO, ATLANTA, DALLAS, SAN FRANCISCO, KANSAS CITY, MO.
FOUNDRIES:—BALTIMORE, MD.—LANSDALE, PENN.—NEWARK, N.J.—MEDINA, N.Y.
ANNISTON, ALA.—BESSEMER, ALA.—HOLT, ALA.—VINCENNES, IND.



Leaks—Right Under Your Feet

These are the kind of leaks that go on for years unnoticed. Just think of the millons of gallons wasted—just think of the thousands of dollars wasted. How do you know that the mains in your city are not leaking somewhere? There is only one way to find out and that is through

A Pitometer Survey

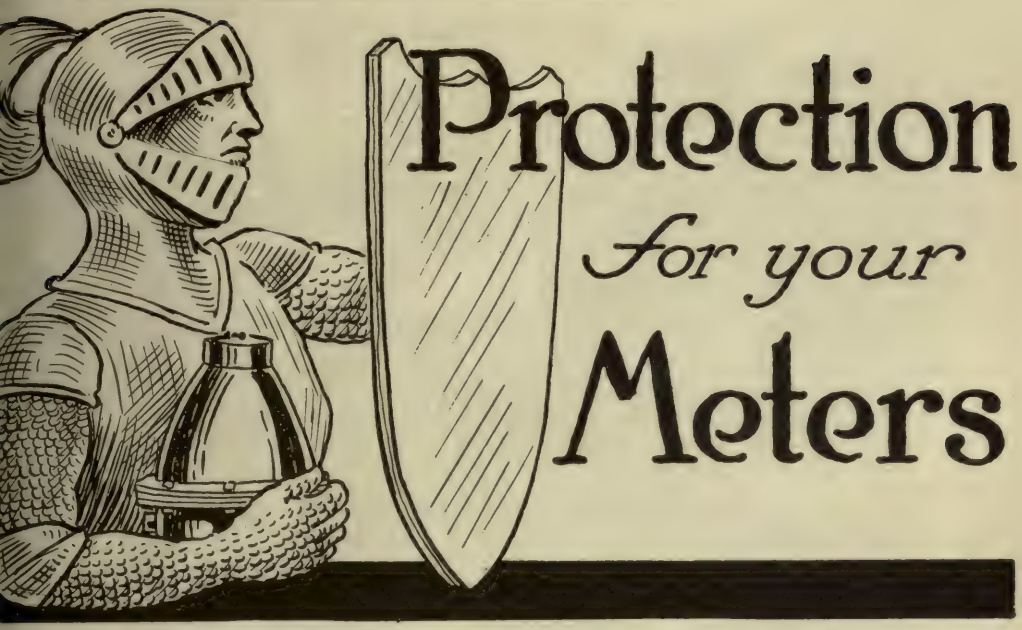
A Pitometer Survey will locate all underground leaks and control house waste thereby making it possible for you to reduce the daily water consumption to a minimum. In Buffalo over 180 underground leaks were discovered through a Pitometer Survey in one section of the city.

A Pitometer Survey will pay for itself many times over in a remarkably short time.

The small town as well as the large city will find its use beneficial.

Write us for detailed particulars.

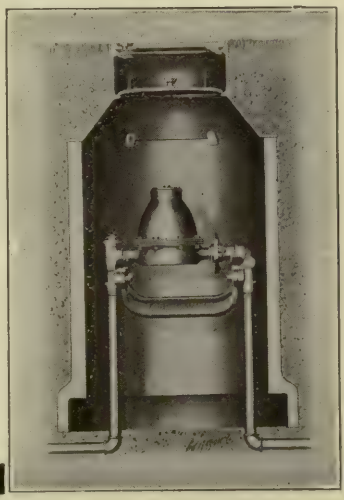
The Pitometer Co., 55 Duane St., New York City



FORD METER BOXES

Just as the knights of yore were protected by armored "casing" so the meters of today are protected by the Ford Meter Box. When once a meter is hermetically boxed in a Ford—no one but the proper people can get at the meter. Even the elements can't do any damage. A Ford Meter Box is one good method of keeping your meters out of the repair shop or scrap heap. They're in use in scores of places with satisfactory results. They earn their costs in short time. They mean Absolute Meter Protection.

Write for illustrated material



ORD METER BOX CO., Wabash, Ind.

GREAT WESTERN ELECTRO CHEM CO.
BUSH, BEACH & GENT
SOLE AGENTS
CARBON TETRACHLORIDE
POTASSIUM CHLORATE
BLEACHING POWDER
LIQUID CHLORINE
CAUSTIC SODA
SAN FRANCISCO, CAL.

A Contract is a Contract

80 Maiden Lane
NEW YORK

Holbrook Building
SAN FRANCISCO

LIQUID CHLORINE

CHLORIDE OF LIME
(Bleaching Powder)

—SODA ASH—

LYNCHBURG FOUNDRY COMPANY

CAST IRON PIPE AND FITTINGS

Bell and Spigot and Flanged

GENERAL SALES OFFICE: Peoples Gas Building, CHICAGO, ILL.

AMERICAN CAST IRON PIPE CO.

MANUFACTURERS OF CAST IRON PIPE & FITTINGS BIRMINGHAM, ALA.

SALES OFFICES
Birmingham, Ala., Box 908
Columbus, Ohio, 607 New Hayden Bldg.
Minneapolis, Minn., 712 Plymouth Bldg.
New York City, No. 1 Broadway
Chicago, Ill., 512 1st National Bank Bldg.
Dallas, Tex., 1217 Praetorian Bldg.
Kansas City, Mo., 716 Scarritt Bldg.
San Francisco, Cal., 711 Balboa Bldg.

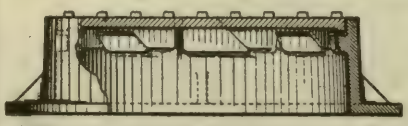
P&C CO

VALVES & HYDRANTS

P&C CO

of UNUSUAL QUALITY — for UNUSUAL SERVICE

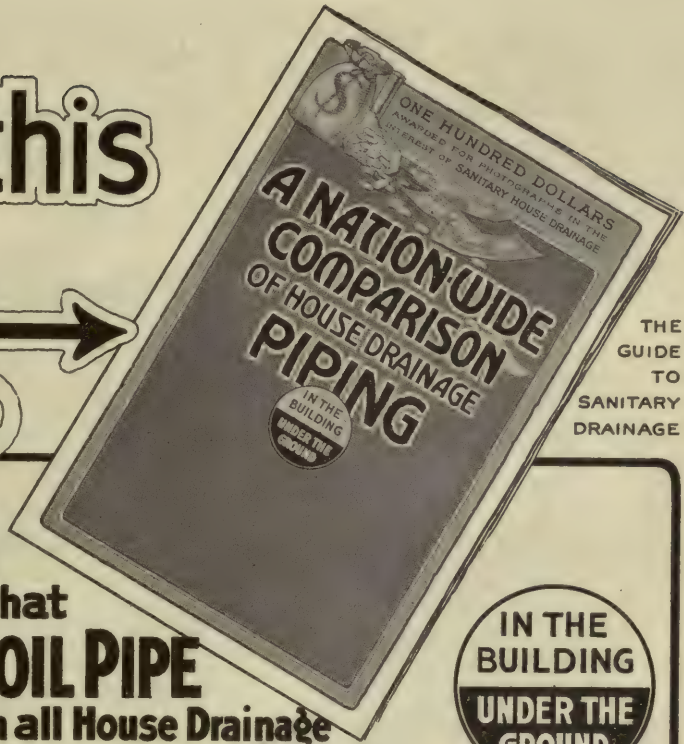
Pratt & Cady Co., Inc. Write for Catalogue Hartford, Conn.



WM. E. DEE COMPANY
80 N. La Salle Street Chicago, Ill.

We manufacture Manhole, Catch Basin and Sewerage Castings of all Kinds. We make anything in Gray Iron. Write for our prices.

Read this Book →



THE GUIDE TO SANITARY DRAINAGE

and you will be convinced beyond doubt that

CAST IRON SOIL PIPE

should be used in all House Drainage

IN THE BUILDING
UNDER THE GROUND

Defective House Drainage Piping means health-menacing conditions, frequent repairs, and costly replacements. To secure sanitary, everlasting and economical House Drainage Piping, insist upon

CAST IRON SOIL PIPE

IT WILL OUTLAST THE BUILDING — *ANY BUILDING*

CAST IRON
THE PIPE EVERLASTING

for HOUSE DRAINS, HOUSE SEWERS ~ No pollution under cellars — No stoppage by tree roots — No danger of breakage by jar or settlement — No costly replacements

for SOIL LINES, VENT LINES, LEADER LINES, WASTE LINES ~ No corrosion — No menace of leaking sewage and sewer gases — No tearing out of floors and walls after pipe is installed

A postal today will bring you a copy of above valuable book

Write to any or all of the following independent and competing makers of Cast Iron Soil Pipe and Fittings, for Specifications and Illustrated Literature

Alabama Pipe & Foundry Co.	Anniston, Ala.	Charlotte Pipe & Foundry Co.	Charlotte, N. C.	Medina Foundry Co.	Medina, N. Y.	Standard Foundry Co.	Anniston, Ala.
American Foundry & Pipe Co.	Penna Sta., Pa.	Coosa Pipe & Foundry Co.	Birmingham, Ala.	National Foundry Co. of N. Y., Inc.	Brooklyn, N. Y.	Superior Mfg. Co.	Bessemer, Ala.
Anniston Foundry Co.	Anniston, Ala.	Crown Pipe & Foundry Co.	Jackson, Ohio	National Pipe & Foundry Co.	Attalla, Ala.	Union Foundry Co.	Anniston, Ala.
Bessemer Soil Pipe Co.	Bessemer, Ala.	Gadsden Pipe Co.	Gadsden, Ala.	Reading Foundry & Supply Co.	Reading, Pa.	Welskittel & Son Co., A.	Baltimore, Md.
Campbell Mfg. Co.	Gadsden, Ala.	Haines, Jones & Cadbury Co.	Philadelphia, Pa.	Salem Brass & Iron Mfg. Co.	Salem, N. J.	Wetter Mfg. Co., H.	Memphis, Tenn.
Casey-Hedges Co., The	Chattanooga, Tenn.	Johnson Co., J. D.	New York, N. Y.	Sanitary Co. of America	Linfield, Pa.	Abendroth Brothers	Port Chester, N. Y.
Central Foundry Co.	New York, N. Y.	Krupp Foundry Co.	Lansdale, Pa.	Somerville Iron Works	New York, N. Y.		

A-1044

DEMING POWER PUMPS
For Municipal Service

The illustration represents the municipal pump house at Dickinson, N. D. A Deming Power Pump in this house, forces the water to an elevated tank, where it is constantly available for domestic needs and fire protection.

In hundreds of municipalities throughout the country, may be found pump houses like this with a Deming Power Pump or Deep Well Head inside. If your town is interested in pumping equipment, send for our 192-page Power Pump Catalogue "J". Municipal officials may have it on request.

THE DEMING COMPANY, Salem, Ohio

HAND AND POWER PUMPS FOR ALL USES

GENERAL DISTRIBUTING HOUSES:

Chicago: Henion & Hubbell
Pittsburgh: Harris Pump & Supply Co.
New York: Ralph B. Carter Co.
Buffalo: Root, Neal & Co.
Boston: Chas. J. Jager Co.
Richmond: Sydnor Pump & Well Co.
Philadelphia: W. P. Dallett
Denver: Hendrie & Bolthoff Mfg. & Sup. Co.
San Francisco: Simonds Machinery Co.
Charlotte, N. C.: Realty Building
Houston, Tex.: H. A. Paine
Agencies in all principal cities

R.D. Wood & Co.

PHILADELPHIA, U. S. A.

ENGINEERS
IRON FOUNDERS
MACHINISTS

Pipe, Hydrants, Valves, Gas Producers, Pumps, Gas Work Materials

Sluice, Head and Penstock Gates
Flap and Shear Valves

The kind that don't wear out

COLDWELL, WILCOX COMPANY
Water Street Newburgh, N. Y.

Chemicals for Water Purification

We manufacture highest grade of

Sulphate of Alumina

also

Chloride of Lime

Liquid Chlorine

PENNSYLVANIA SALT MFG. CO.

WIDENER BLDG. :: :: PHILADELPHIA, PA.

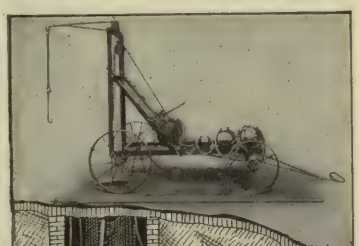
SEWER CLEANING MACHINERY

The Kuhlman Sewer Cleaning Apparatus will clear any sewer of dirt, gravel, sand, cinders, rags, paper, tar or practically anything.

It does the work quickly and cheaply. It's a great time and money saver. It is being utilized by scores of progressive municipalities all over the country.

Write at once for prices and other interesting information. We also make sewer rods. Send for free sample.

The Champion Potato Machinery Co.
338 Sheffield Ave. Hammond, Ind.



Manufacturers of **CAST IRON PIPE**

for WATER—GAS—CULVERTS—SEWERS

Special Castings:-Also Flexible Joint Pipe-Cylinders-Tubes, Milled and Plain Ends-High Pressure Fire Service Pipe.

"Quality and Service Guaranteed"

WARREN FOUNDRY & MACHINE CO

Works: Phillipsburg, N. J.

Sales Offices: 11 Broadway, N.Y. / 201 Devonshire St., Boston, Mass.

APPROVAL

HERSEY DETECTOR METER

The Hersey Detector Meter has been accepted for eleven years in 3", 4", 6", 8", 10" and 12" sizes without any restrictions or conditions of any kind by every Insurance Company, Stock and Mutual, doing business in the United States, and by the Water Departments and Water Companies in more than 500 Cities and Towns for use on over 3,000 Fire Services protecting nearly $2,000,000,000 worth of Insured Property

HERSEY MANUFACTURING COMPANY

BOSTON — COLUMBUS, O. — SAN FRANCISCO
NEW YORK — PHILADELPHIA — LOS ANGELES
CHICAGO — ATLANTA — PORTLAND, ORE.

MATHIESON ALKALI WORKS, Inc.

Niagara Falls, N. Y.

Castner Electrolytic Process

Eagle-Thistle Brand

CHLORIDE OF LIME

In 200, 450 and 750-lb. drums Strongest, quickest-settling, most reliable.

LIQUID CHLORINE

Pure anhydrous, for use with any control apparatus. In improved and convenient cylinders, 105 and 150 lbs. net.

ARNOLD, HOFFMAN & CO., Inc.

Sole Agents

Boston — 61 Broadway — Philadelphia
Providence — New York — Charlotte, N. C.

ELIMINATE WASTE OF MONEY AND LABOR!!!

Every Water Meter frozen this past Winter called for an unnecessary expenditure of both. It is not enough to Conserve by simply installing Meters—they must be properly Housed.

"MODERN" METER HOUSINGS-Improved TOPS with Inner Lids and Simplified CONNECTIONS have proven their EFFICIENCY through actual Demonstration.

They Protect the Meter — eliminate loss through Service Leakage—are lowest in first cost—easiest to install and operate. If interested in more Efficient Meter Installations, send for samples or more detailed information.

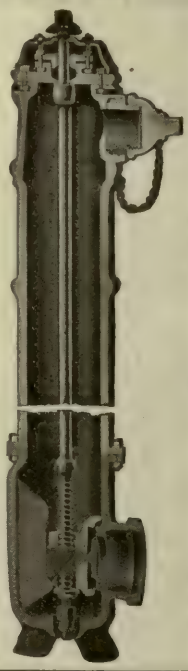
MODERN IRON WORKS

Manufacturers and Distributers

Improved Meter Housings and Connections—Service and Valve Boxes—Brass Goods—Pipe Derricks—Water Works Gages—Special Castings and other Water Works Supplies.

510 OHIO ST., QUINCY, ILL.

FIRE HYDRANTS



Frost-Proof

Simple-Efficient

All parts removable without digging up hydrant. Special device prevents street from being flooded should stand pipe be broken. Minimum expense to install and maintain.

LUDLOW

GATE VALVES

FOR

Water, Steam
Gas, Oil, Hydraulic
or Electric Operated

All styles, any size, all pressure

- - THE - -

Ludlow Valve Mfg. Co

TROY, N. Y.

Branch Offices

New York Chicago Boston
Philadelphia Pittsburg
Kansas City

PURE WATER
and
PITTSBURGH FILTERS
are found together

Where Pittsburgh Filters are at work there you will find pure water.

Over 700,000,000 gallons of pure water is being supplied to 180 municipalities and in no way can it be had more surely and at the same time so economically as by the use of Pittsburgh Filters.

Write for booklet

PITTSBURGH FILTER MFG. CO.

Chicago Pittsburgh, Pa. Kansas City

"Let those now love who've never loved before,
And those who always loved now love the more."

LAMBERT WATER METERS

Long Life.

Lasting Accuracy.

All parts inter-changeable.

Maintenance cost nominal.

Their merits have made meter systems popular. A good article is always worth the price. All improvements which the tests of time and long service show to be requisite in a **Perfect Water Meter** are embodied in the **Lambert.**

ONE MODEL ONLY

Made in all sizes, 5/8" to 6", of best bronze Composition throughout, fitted with Unbreakable reinforced disc-pistons.

Illustrated Price List on Application. Address Dept. C.

THOMSON METER CO.

100-110 BRIDGE ST., BROOKLYN, N.Y.

PURE

Liquid EBC Chlorine

INSURES PURE DRINKING WATER

And the cost is so trifling. Just think—for 2c a year per capita you insure every man, woman and child in your town against the ravages of typhoid and other water-borne disease.

Write for free book—"THE WISE CITIES"—It tells why.

Electro Bleaching Gas Company

16 E. 41st St. New York City

AMERICAN AND NIAGARA

WATER METERS

WRITE FOR LITERATURE BELOW

WRITE FOR TRIAL METER

WATER METER RATES AND REGULATIONS
ADVANTAGES OF USING WATER METERS
MODEL WATER METER SPECIFICATIONS
FACTS AND FIGURES ABOUT OUR METERS IN SERVICE
AMERICAN AND NIAGARA WATER METERS
WATER METER ACCESSORIES
SETTING AND TESTING WATER METERS
PRICE LIST WATER METERS AND ACCESSORIES

TRADE MINWAX MARK

THE PERMANENT
WATERPROOFING

Used on notable municipal works the country over. Send for the "Minwax" Bulletins describing waterproofing and protective products for every purpose.

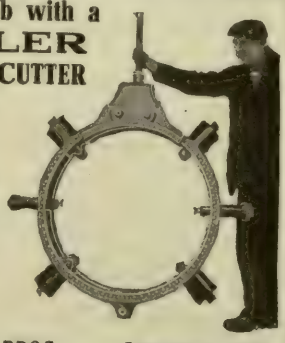
THE MINWAX COMPANY, Inc.
18 EAST 41st STREET NEW YORK

PIVOT LOCK COVER

For Manholes Meter Boxes
Street Sweeping Receptacles

SAFE, ECONOMICAL and SANITARY
Write for details
THE EAST IRON AND MACHINE CO., Lima, O.

Cut that *Next* Job with a
STRICKLER
RATCHET PIPE CUTTER



You will be surprised at the speed. At the Smooth, Clean, Square Cut. No filing or reaming after the Automatic Strickler has done its work. Each size cuts a range of pipe sizes.

Catalog on request.

W. W. STRICKLER & BROS., Columbus, Ohio

ORIGINAL
OF COURSE WE HAVE IMITATORS
YOU KNOW WHY—
the Clark Meter Box has *made good* in 25 years of actual service. Thousands of water departments use it. No other "*Just As Good*" Can't Be.
Prices are the lowest. Quick delivery. Other Clark Goods are in same class.

Trade Mark

H. W. CLARK CO.
130 So. 17th St., Mattoon, Ill.
Everything for the Water Works
New York Salt Lake City
San Francisco Chicago

S. E. T. SPECIALTIES

FOR IMPROVED PUBLIC SERVICE

The Coldest Winter on record proves our claim that the

Jersey Meter Box is "FREEZE" PROOF

All sizes up to 36 inches. *Write for printed matter.*

S. E. T. VALVE & HYDRANT CO.

50 Church Street New York

SLUICE GATES, CHECK VALVES, AIR VALVES, INDICATOR POSTS, ETC.

GATE VALVES **EDDY** **FIRE HYDRANTS**

Hydraulically and Electrically Operated Valves and Sluice Gates. Valves Designed For All Kinds of Service.

EDDY VALVE COMPANY, WATERFORD, N. Y.

New York Chicago Boston San Francisco Philadelphia

COLUMBIAN IRON WORKS

CHATTANOOGA, TENN.

Manufacturers of Fire Hydrants, Valves, Valve Boxes, Sluice Gates, Meter Boxes and Water Works Supplies

ESTIMATES PROMPTLY FURNISHED

Trade **LEADITE** *Mark*

Registered U. S. Patent Office

For Jointing Cast Iron Water Mains

NO CAULKING required

Saves 50% to 65%

Write for information and price

THE LEADITE COMPANY, Inc.

100 S. Broad Street Philadelphia, Pa.

The Best Material for CALKING Joints in Cast Iron Pipes is

Ulco Lead Wool

Write for particulars to

UNITED LEAD COMPANY

111 BROADWAY, N.Y. CITY

EASY-TO-READ

Hinged-Lid Meter Setting

Guaranteed to protect meter from freezing if installed according to instructions. Meter is easy to read and easy to remove. Will save you money in installation and in service.

Write for full information.

Lewis McNutt

28 McNutt Bldg.

Brazil, Indiana

The MANOGRAPH

Unequalled for

Simplicity and Accuracy

The MANOGRAPH is the only pitot recorder in which there are no complicated or invisible working parts.

Open the door and all working parts are exposed for inspection.

No springs, floats, diaphragms, cams, cables or other complicated and delicate mechanisms to get out of adjustment.

The MANOGRAPH may be checked and corrected for accuracy instantaneously.

These features are exclusive and make the MANOGRAPH the simplest and most accurate of all pitot recorders.

A bulletin descriptive of the MANOGRAPH may be obtained from

Water Works Equipment Co.
50 Church Street New York City

OZONE

The Most Powerful Germicide and Oxidizing Agent Known to Science

PURIFIES WATER

by destroying

ODORS, TASTES and BACTERIA

THE IDEAL AND PERFECT
ELECTRIC OZONE SYSTEM CHICAGO USA
PURIFIER OF WATER

Harmless, Inexpensive, Effective

Mr. Geo. A. Soper in Engineering News, Vol. 42, page 250, says, "The claims made for the ozone treatment of water are as distinct and its functions as clearly defined as are those of filtration and sedimentation. Ozonation aims to eliminate bacteria from water and to destroy unpleasant colors and odors of vegetable origin. It is especially valuable in removing unpleasant odors."

We furnish ozone systems for cities, institutions, etc.

Electric Ozone Sterilizer Co.
53 W. Jackson Blvd., Chicago, Illinois

Sewage Treatment

by the

Activated Sludge Process

These cities have either completed plants or experimental units:

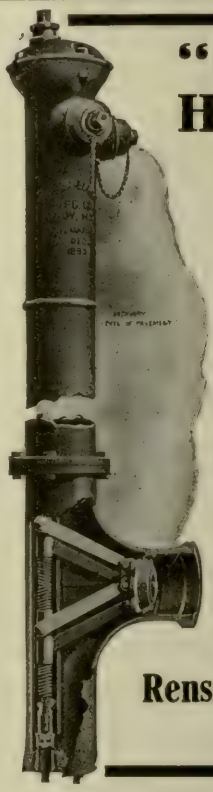
Milwaukee, Wis.	Pasadena, Cal.
Houston, Tex.	San Marcos, Tex.
Cleveland, O.	Brockton, Mass.
New Haven, Conn.	Escanaba, Mich.
Paris, Tex.	Lawrence, Mass.
Worcester, Mass.	Chicago (Sanitary District)

Keep posted about their results in the interest of your city.

A BIBLIOGRAPHY

of the process is yours for the asking.

General Filtration Co., Inc.
Cutler Bldg. Rochester, N. Y.



"COREY" HYDRANT

Rensselaer Improved Type

Get our New Book 9 and New Bulletin "A"

"Do It NOW"

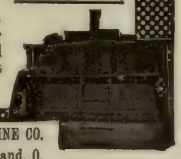
Rensselaer Valve Co.
TROY, N. Y.

Power with Less Coal

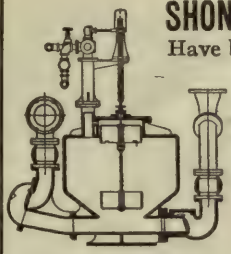
Now more than ever before is it good business for the individual industrial plant to operate power and light equipment with the least possible fuel, owing to the present high cost of coal.

Furthermore it has been demonstrated that it is a necessity for our country to reduce the total consumption of fuel to the lowest possible point.

It is a recognized fact that Gas Power Plants operate on far less fuel than any other form of power plant.



THE BRUCE-MACBETH ENGINE CO.
2137 Center St. N. W., Cleveland, O.



SHONE SEWAGE EJECTORS

Have been used for pumping city sewage in all parts of the world for over 35 years.

Unequalled for reliability, economy and durability.

Automatic and odorless.

Send for Bulletin P 4000

SHONE COMPANY
225 Institute Place, CHICAGO

ACTIVE SERVICE

YEARS OF SUCCESS

Filtration Plants
for
Municipal Needs
Y.M.C.A.'s, Colleges
and all Institutions

Write for Booklet

NORWOOD ENGINEERING COMPANY

Florence Mass.

NEW YORK CHICAGO
Keystone Arctic
Keystone Compound
Eureka Utility
COLUMBIA, S. C. KANSAS CITY

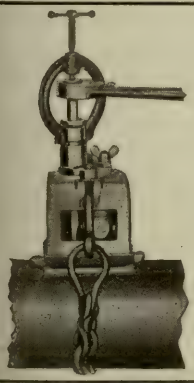
Water Meters

Pittsburgh Meter Co.
East Pittsburgh, Pa.
LOS ANGELES SEATTLE

MICHIGAN PRODUCTS

Fire Hydrants
Gate Valves
Sluice Gates
Check Valves
Foot Valves
Shear Valves
Tide Valves
Sleeve Valves
Tapping Machines
Indicator Posts
Valve Boxes

FLOWER-STEPHENS MANUFACTURING COMPANY
103 Parkinson Street, Detroit, Mich.



SMITH CORPORATION TAPPING MACHINE

The simplest, lightest, and most durable machine of its kind on the market. Can be carried by one man and readily operated by a boy. Very simple in construction. Nothing to get out of order. Corporation cock insertions made in the quickest possible time without any interruption to the supply. Machine sent on approval anywhere.

Write for descriptive matter of Water Works Specialties.

THE A. P. SMITH MFG. CO. East Orange, N. J.

Valuable Illustrated Material, Statistics, Etc., Regarding Methods, Materials and Appliances for Public Improvement Work, Sent Free of Charge.

The AMERICAN CITY should be mentioned when writing for material. Officials who check over these items each month and write for such printed matter as interests them will find this a convenient way of keeping their information files up to date.

Clogged Sewers Are Dangerous.

The interesting photographs in the folder on "The Turbine System of Sewer Cleaning," just issued by the Turbine Sewer-Machine Company, 197 Eleventh Street, Milwaukee, Wis., explain the necessity for this method of cleaning sewers better than any descriptive text could. They reveal the causes of sewer clogging brought to light by the thoro work of the Turbine sewer-cleaning machines, and give some idea of the increase in pipe capacity that is brought about by the cleaning. Other illustrations show how the machine is operated, and explain its working parts. If your sewers have not been cleaned recently, this folder will prove of special importance to your city.

Paint That Roof!

Under this title, The Pioneer Asphalt Company, 7325 Woodlawn Avenue, Chicago, Ill., has issued a circular folder in which "Pioneer" Rubber Coat is recommended for the protection of roofs from the elements. It is said to give "a tough, pliable, rubberlike coating" to the roof which will effectively resist extremes of weather. It is stated that this product is 99.9 per cent pure asphalt, and is made from a natural deposit of hydro-carbon. Another folder describes "Pioneer" cement fibre for repairing leaky roofs, and for general insulating work.

Flushing, Sprinkling and Oiling Units for Municipalities.

All street department and public works officials will be interested in the catalog (No. 1299), issued by the Studebaker Corporation, South Bend, Ind. This catalog contains fifteen pages of text and illustrations on the subject of flushing, sprinkling and oiling units made by the corporation. The adaptations of the many equipments shown are made the subject of careful expositions. Methods of flushing, with the results of water application at varying angles, are discussed in some detail.

Traffic Signs for the Business District.

Joseph N. Early, 320 Broadway, New York City, calls attention in catalog D to traffic signs for crowded intersections, school and hospital streets, one-way streets, and for parking regulations. Stop and Go traffic signals for day and night service are shown. A number of different designs of traffic and safety zone standards, with lantern equipments, complete the display in this catalog.

Police Signaling Systems.

The Gamewell Fire Alarm Telegraph Company, Newton Upper Falls, Mass., presents, in Bulletins P-14, -15, and -16, police signaling systems. Central office desks equipped with means for handling all reports, inter-communications, emergency signals, public exchange connections and for testing the lines and working apparatus, are described. Signal boxes and flash lights are also shown.

Water Meters Should Be at the Curb.

Sixteen reasons why water meters should be installed at the curb and not in the basement are given in "Modern Meter Housings," a pamphlet regarding meter boxes, issued by the Modern Iron Works, 510 Ohio Street, Quincy, Ill. Yokes and turnbuckle connections for outside and inside meter installations are also described and illustrated.

Municipal Expenditures Reduced.

The literature of the Bureau of Municipal Research, 261 Broadway, New York City, explains how the municipal surveys which they undertake enable city and county governments to reduce expenses and yet give better service. Special attention is given to salary standardization, accounting, budgets, police and health departments, refuse disposal, taxation methods, etc.

Contractors' Machinery of Every Description.

Bulletin No. 230, issued by Zelnicker, in St. Louis, lists bargains in municipal and contractors' machinery, ranging from dinky locomotives, hoisting engines and steam shovels to tool handles, lamps and lumber crayons. A number of offerings in centrifugal and duplex pumps of standard makes are worthy of investigation, also the concrete mixers to which attention is called.

One Solution of the Industrial Housing Problem.

A booklet entitled "Community Homes" has been issued by The Hydraulic Pressed Steel Company, for the purpose of assisting those who are giving consideration to the much-discussed question, industrial homes. It takes up in an interesting manner the business and architectural aspects of home building, and points out the advantages of concrete over frame construction. The erection of concrete dwellings by the use of "Hydraulic" pressed steel forms and equipment is described with illustrations. Copies of the booklet may be secured upon application to the Allied Publicity Bureau, 11705 Detroit Avenue, Cleveland, Ohio.

Road and Street Building Machinery.

"Everything for the Road Maker" aptly describes the contents of the 1918 catalog of the Good Roads Machinery Company, Inc., Kennett Square, Pa. In it are listed road building and maintenance machines of every description, from plows to rock crushers, and from two-man rakes to combination roller and traction engines. Road and highway officials will find this catalog of interest and value.

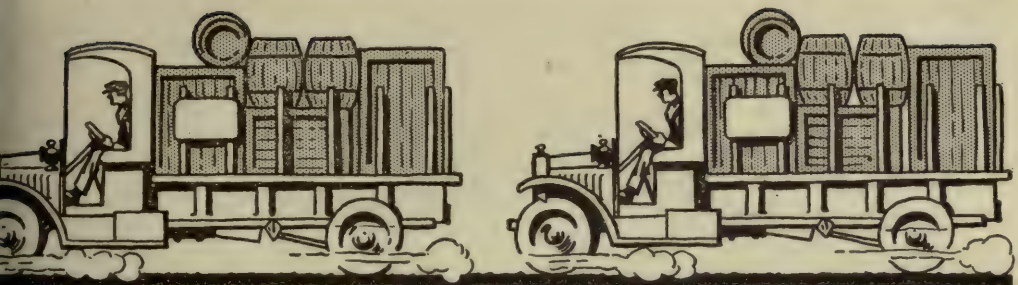
Making Street Lamps Accessible.

"The value of any lamp depends absolutely on the condition in which it is kept." This familiar truth, taken from Catalog B-17 of the Thompson Electric Company, 5606 Euclid Avenue, Cleveland, Ohio, presents the fundamental argument upon which the claims of the Thompson Safety Disconnecting Hangers described in the catalog are based. By means of a patented disconnecting device with a pulley and rope attachment, lamps which would otherwise be difficult to get at, or altogether out of reach of the cleaner, are made easily accessible.

Truscon Products for Road Making.

Reinforcing steel and wire mesh, Kahn armor plate for expansion joints, and Kahn curb bars for road work are described in the booklet, "Kahn Building Products," issued by the Truscon Steel Company, Youngstown, Ohio. A complete line of products for the erection of steel buildings and warehouses is also included.

Continued on page 36



2 Men–2 Motor Trucks
1 Man–1 Trailer

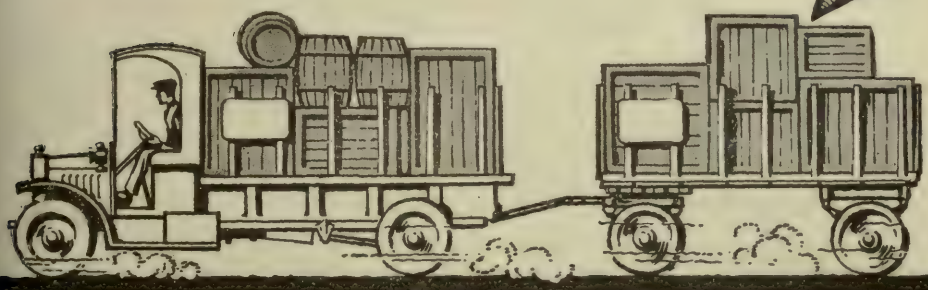
The picture tells the story. You can readily see that by substituting a Watson Trailer for that extra motor truck, a large saving may be effected. You do away with chauffeur, gasoline and other expenses attached to motor truck maintenance.

The fact that so many municipalities use the trailer method is convincing proof that it is practical and cuts hauling and trucking costs nearly one half.

If you want to get the most from your motor units, write for our illustrated matter. It tells you HOW.

Watson Wagon Co.

30 CENTER ST. CANASTOTA, N.Y.



Valuable illustrated material, catalogs, statistics, etc., as mentioned below, relative to methods, materials and appliances for public improvement work, will be sent free of charge if you mention THE AMERICAN CITY.

Water Meter Maintenance.

A booklet issued by the Neptune Meter Company, 50 East Forty-second Street, New York City, takes up the all-important question of low first cost versus high maintenance cost, and on the conclusions reached bases the claims for the Trident meters, which have a splendid record of satisfactory service and unusually low maintenance cost. The pamphlet also shows graphically how meters are instrumental in materially reducing water consumption.

Plants and Shrubs to Beautify Landscapes.

Under the title "Home Landscapes," the Hicks Nurseries, Westbury, Long Island, N. Y., has issued its 1918 catalog of trees, shrubs, flowering plants and fruit-bearing trees and shrubs. Numerous diagrams and photographs call attention to the limitless possibilities of plants and shrubs for beautifying and lending refinement and seclusion to private estates, as well as to public places.

Motor Trucks of America.

A new edition of this annual volume has been issued by the B. F. Goodrich Rubber Company, Akron, Ohio. In addition to listing complete specifications on trucks made by all the reliable auto truck manufacturing companies of this country, it contains an authoritative and practical introductory article on the subject of "A Standard System for Recording Truck Operating Costs," by S. V. Norton, Manager of Truck Tire Sales for the Goodrich Company. The purpose of this publication, of which this is the sixth edition, is to place in the hands of prospective buyers of motor trucks reliable information regarding each year's offerings of the various manufacturers, so that buyers will be able to make intelligent selections to meet their particular needs.

Sewage Ejectors With Good Records.

Leaflet 41 of the Shone Company, 225 Institute Place, Chicago, Ill., contains a large number of very convincing letters of endorsement from building engineers, water-works superintendents and other municipal officials, testifying to the dependable and satisfactory service rendered over long periods by the Shone Sewage Ejectors.

Two Interesting Pamphlets on "Tarvia."

"The Avenue of Sublime Peace," by William F. Mannix, editor of "The Memoirs of Li Hung Chang," tells the story of the "good roads" awakening in China under the leadership of its new "engineer-president," Li Yuan Hung. The avenue which gives the pamphlet its name is an imperial boulevard in the Forbidden City which has recently been "Tarviated." Another pamphlet describes "Tarvia-A" and shows many well-known boulevards which have been preserved with this product. Inquiries should be addressed to The Barrett Company, 17 Battery Place, New York City.

Cast Iron Pipe in Service.

A booklet descriptive of "Universal Cast Iron Pipe" and its uses is being distributed by the Central Foundry Company, 90 West Street, New York City. Attention is called to the ease of installation, ratchet wrenches being the only tools needed. A number of views show the pipe installed under difficult circumstances, and others give an idea of its endurance and flexibility under great strains.

An Efficient Pipe Placing Machine.

The McNutt pipe placing machine is an instrument designed to do away with trench digging and back filling in order to lay iron or lead pipe, and is especially valuable on paved streets, where it saves the expense and inconvenience of tearing up the surface to install or replace piping. Its operation is explained in a folder issued by Lewis McNutt, 28 McNutt Building, Brazil, Ind.

How Do You Cut Your Pipe?

If you haven't heard of the "Strickler" way, it would pay you to investigate it. A pamphlet entitled "Others Are Saving Money," issued by W. W. Strickler & Bros., Columbus, Ohio, describes the Strickler ratchet pipe cutter, and points out its advantages over old methods. The chief arguments in its favor are the speed and ease with which it does its work, and the smooth, clean, square cut it makes, eliminating all reaming and filing costs.

Hinged Lids for Meter Boxes.

Water departments using meter boxes or expecting to install same will be interested in writing Lewis McNutt, 28 McNutt Building, Brazil, Ind., for information about this meter box setting which has many important advantages.

Water-Works Supplies.

The catalog of A. P. Smith Mfg. Co. includes illustrations and full descriptions of such lines as Pipe Cutting Machines, Fire Hydrants, Calking and Tapping Machines, Lead Furnaces and other water-works specialties.

Combination Trolley and Street Lighting Poles.

The Electric Railway Equipment Company, Cincinnati, Ohio, has published a catalog describing Elreco Combination Poles, which avoid the unsightly duplication of street railway and electric lighting poles on a single street.

Typhoid Fever Elimination.

The Electro Bleaching Gas Company, 16 East 41st Street, New York City, is distributing free of charge a book entitled "The Wise Cities." It shows how municipalities can insure the entire populace against water-borne typhoid epidemics of 2 cents per year per capita.

Attractive Fencing for Schools, Parks, Etc.

The illustrated catalog of the Enterprise Iron Works, 1161 East 24th Street, Indianapolis, Ind., shows how Enterprise fencing is protecting and beautifying the surroundings wherever it is used.

Safety Storage of Oil and Gasolene.

Every municipal executive, fire chief or citizen concerned with the safe storage of inflammable liquids will be interested in the booklet of S. F. Bowser, Inc., Fort Wayne, Ind., relative to the company's system for storing oil and gasoline as safely as water.

Municipal and County Surveying Instruments.

City and county engineers and all others using surveying instruments and accessories will be interested in the catalog on this subject, published by the Buff & Buff Manufacturing Company, 221 Lamartine Street, Jamaica Plains, Boston, Mass.

Manhole and Meter Box Covers.

Officials having to do with street openings will be interested in the illustrative literature relative to pivot lock covers manufactured by the East Iron & Machine Company, Lima, Ohio.

Fire Hydrants and Gate Valves.

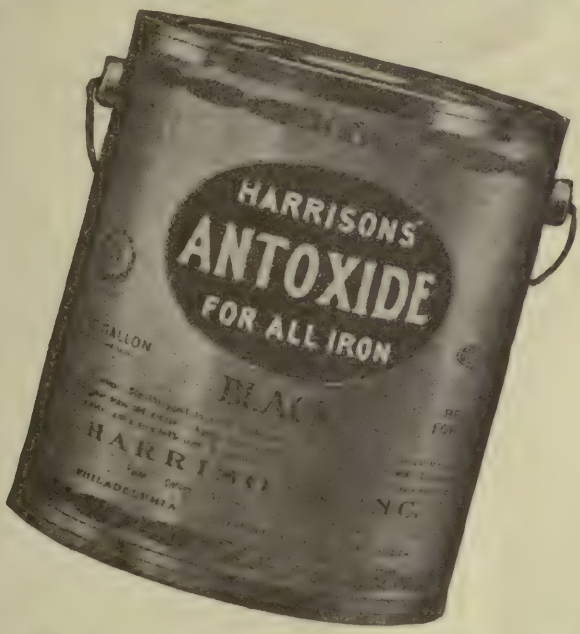
These specialities of the Eddy Valve Company, Waterford, N. Y., are illustrated and described in their catalog, which also covers sluice gates, indicator posts, and other water-works appliances.

Sewage Works Experience in New Jersey.

Proceedings of the Third Annual Meeting of the New Jersey Sewage Works Association. 1918. 48 pp. (Apply to Frederick T. Parker, Secretary-Treasurer, Atlantic City, N. J.)

(*Continued from page 34*)

DU PONT AMERICAN INDUSTRIES



Paint Through Rust—Not Over It

Mail this Coupon marking X before subject that interests you

- [ ] Antoxide Metal Paint
- [ ] Industrial Paints
- [ ] Ry. and Marine Paints
- [ ] Auto Enamel
- [ ] Rayntite Top Material
- [ ] Motor Fabrikoid
- [ ] Craftsman Fabrikoid
- [ ] Industrial Dynamites
- [ ] Trapshooting
- [ ] Commercial Acids
- [ ] Challenge Collars
- [ ] Py-ra-lin Toilet Goods

Name.....
Address.....
City.....
State.....

Visit Du Pont Products Store
1105 Boardwalk, Atlantic City, N. J.

Rust is a metal eater. To paint over it is merely camouflage. The destructive action still continues underneath the paint. The only efficient way to stop this evil is to paint through the rust.

HARRISON ANTOXIDE

is a foe to rust because it is rust inhibitive. It stops rust's action because it permeates the rust or scale, checks its progress and actually protects the metal underneath. It preserves the metal from oxidization because it eliminates the cause of this destructive agent. For this reason it is incomparable for painting iron fences, drains and all kind of metal work. Comes in five standard shades—red, bronze, green, maroon and black.

Check Antoxide in the coupon. Sign and send it in. Get the full information.

Harrison Works

Philadelphia Pa.

Owned and Operated by

E. I. du Pont de Nemours & Co.

DU PONT

Proposal and For Sale Notices, Help Wanted and Situation Wanted Advertisements, Etc.

PAVING

The City of Onaway, Presque Isle County, Michigan, will receive sealed proposals up to 7.30 o'clock P. M., standard time, June 17th, 1918, for paving State Street from the east side of Second Street to the west side of Main Street with crushed stone (macadam), with Tarvia X filling, using penetration method, and grading, curbing and draining, said paving to be performed according to the plans, specifications and diagram now on file in the office of the Clerk of the said City of Onaway, said proposals to be addressed and delivered to Will B. Gregg, City Clerk. Certified checks for the amount of five hundred dollars ($500.00) must accompany each bid, payable to the Treasurer of the City of Onaway, and shall be forfeited to said City of Onaway in case the bidder shall refuse or neglect to enter into a contract as per said proposal with said City of Onaway within ten days after being notified of the acceptance of his proposal by the said City of Onaway. The successful bidder shall furnish a surety company bond for such amount and in such company as shall be satisfactory to the said City of Onaway. The Common Council of the said City of Onaway reserves the right to reject any and all bids or waive defects that may be in favor of the City of Onaway.

WILL B. GREGG,
City Clerk.

Bids close June 22, 1918.

RESERVOIR

Sealed bids will be received by the Board of Commissioners of the City of Abilene until 2 o'clock P. M., June 22, 1918, for the construction of a storage reservoir for water supply. The work contemplated is principally an earth dam, containing about half a million cubic yards, together with spillways, intakes, etc. Plans and specifications on file with the City Engineer and will be furnished on deposit of $25, which will be refunded on return of same in good order. The right is reserved to reject any and all bids or parts thereof. Each bid must be accompanied by certified check for $10,000 or surety bond for $50,000.

Address

H. L. ROBERTS,
City Secretary,
Abilene, Texas.

W. A. RINEY,
City Engineer
Abilene, Texas.

FOR SALE

The City of Highland Park, Michigan, offers for sale the following chinery and equipment:

1 Municipal Mixer (Steam)	1	Yd.	Cap.	Used	½ seaso
1 Milwaukee " "	1	"	"	"	Never
1 Foote " "	¾	"	"	"	½ seas
1 Foote " (Gasoline)	¾	"	"	"	2 "
1 Foote " "	½	"	"	"	3 "
1 Coltrin " "					3 "
1 Municipal " "					3 "
2 Jaeger " "	¼	"	"	"	1 "
Souting outfit complete, 2 sets crosswise, trucks for same, 4 extra 10 feet sections track.					
1 Industrial Locomotive	1	"	"	"	1 "
12 " Cars					
1500 Ft. " 24" Rail					
1 " Locomotive					
10 " Cars	1	"	"	"	1 "
1000 Ft. " 24" Rail					
1 Fairbanks-Morse Pump (Gasoline)				"	2 "
1 Novo Pump "				"	2 "
1 Gray Motor Co. " "				"	2 "
1 Wagner Electric Motor Hoist				"	1 "
1 Ideal " " "				"	1 "
1 Western " " "				"	1 "
1 Bulldog Hoist (Gasoline)				"	1 "
1 Buckey Traction Digger				"	1 "

Address all bids and communications to Mr. E. C. Foster, Superintend of Public Service, 28 Gerald Avenue, Highland Park, Michigan.

Bids: June 18, 1918.

MAIN STREET IMPROVEMENT

RIDGEFIELD PARK, N. J.

Notice is hereby given that sealed bids wil be received by the Board of Commissioners of the Village of Ridgefield Park, N. J., for the reconstruction of a portion of Main Street and a portion of Winant Avenue, in the Village of Ridgefield Park, N. J., in the County of Bergen, with an Asphalt Concrete Grade "A" surface upon a Macadam foundation; estimated amount of surface pavement required is 12,730 square yards, of foundation 1,070 cubic yards; and opened and read in public at the Municipal Building, 232 Main Street, on Tuesday, June 18th, 1918, at 9 o'clock P. M.

Drawings, specifications and forms of bid, contract and bend for the proposed work, prepared by Rudolph Schweizer, Jr., Village Engineer, and approved by the State Commissioner of Public Roads, have been filed in the office of the said Engineer, at 232 Main Street, Ridgefield Park N. J., and of said Commissioner at the State House, Trenton, N. J., and may be inspected by prospective bidders during business hours. Bidders wil be furnished with a copy of the specifications and blue prints of the drawings by the Engineer on proper notice and payment of cost of preparation. Bids must be made on the standard proposal forms in the manner designated therein and requ the specifications, must be encl sealed envelopes, bearing the na address of bidder on the outsi dressed to M. D. Starker, Clerk lage of Ridgefield Park, and n accompanied by a certified ch cash for not less than $1,000, delivered at the place and on t above named. The standard form is attached to the specifi copies of which wil be furnis application to Engineer.

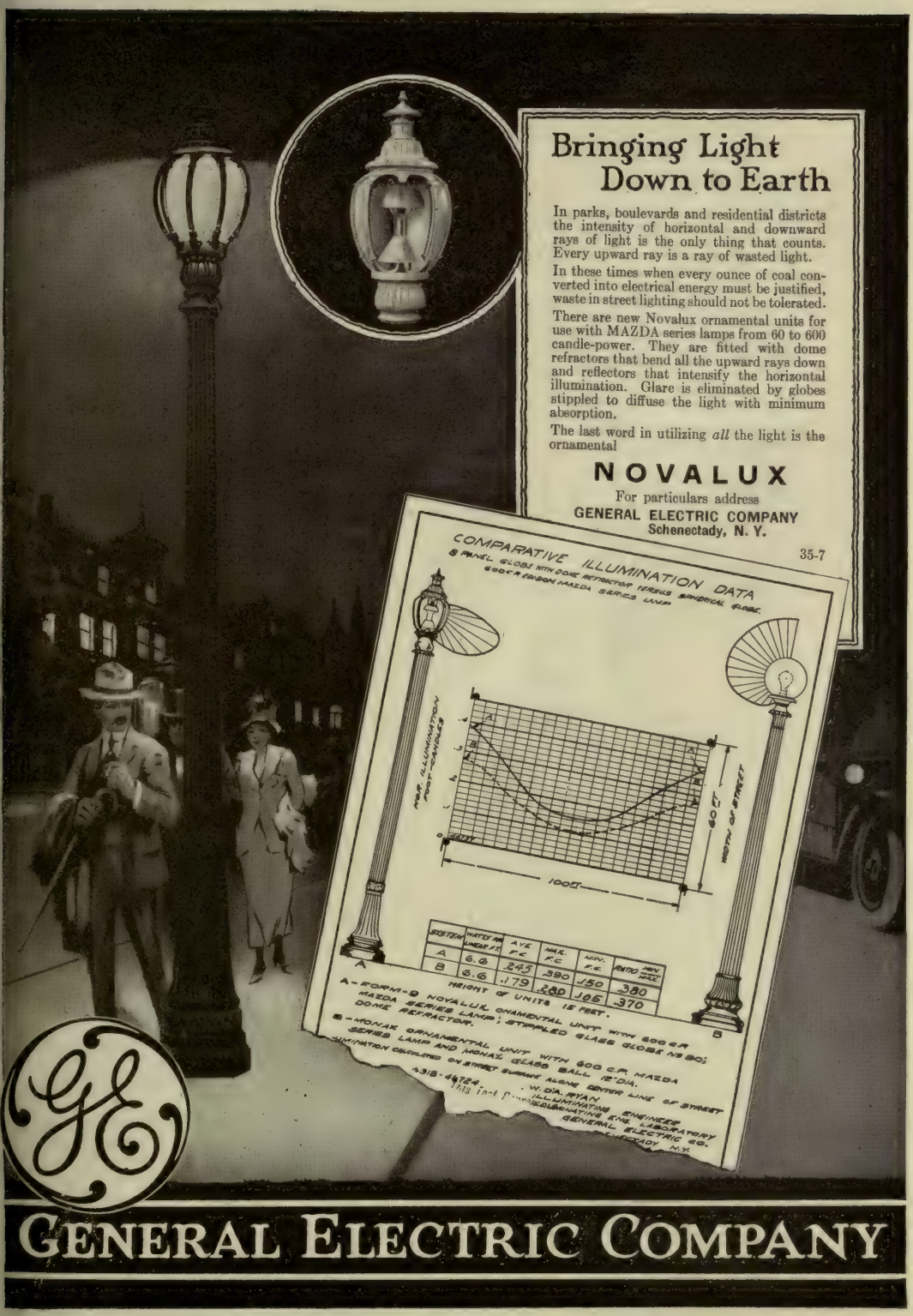
By order of Board of Commis

M. D. STARKE
C

We Wan to Buy

A small iron and w working plant, prefer making farm machiner small town with pl land for expansion. dress Box 60.

When writing to Advertisers please mention THE AMERICAN CITY.


Bringing Light Down to Earth
In parks, boulevards and residential districts the intensity of horizontal and downward rays of light is the only thing that counts. Every upward ray is a ray of wasted light.
In these times when every ounce of coal converted into electrical energy must be justified, waste in street lighting should not be tolerated.
There are new Novalux ornamental units for use with MAZDA series lamps from 60 to 600 candle-power. They are fitted with dome refractors that bend all the upward rays down and reflectors that intensify the horizontal illumination. Glare is eliminated by globes stippled to diffuse the light with minimum absorption.
The last word in utilizing *all* the light is the ornamental
NOVALUX
For particulars address
GENERAL ELECTRIC COMPANY
Schenectady, N. Y.
35-7

Cities and Towns Counties and States

in every part of the country are saving thousands of dollars for tax payers by means of little ads in the

Proposal Advertising Columns

of the

ENGINEERING NEWS-RECORD

This paper, with its circulation of 35,000 copies weekly, is read by practically all the important contractors and manufacturers who want contracts and know how to figure close in order to land them.

Get their prices on YOUR Contracts

It means a big saving, reliable work and the best evidence that you believe in business methods in municipal government.

To see how other towns save money

write for a recent copy of the Engineering News-Record (free) and look through the Proposal pages of this

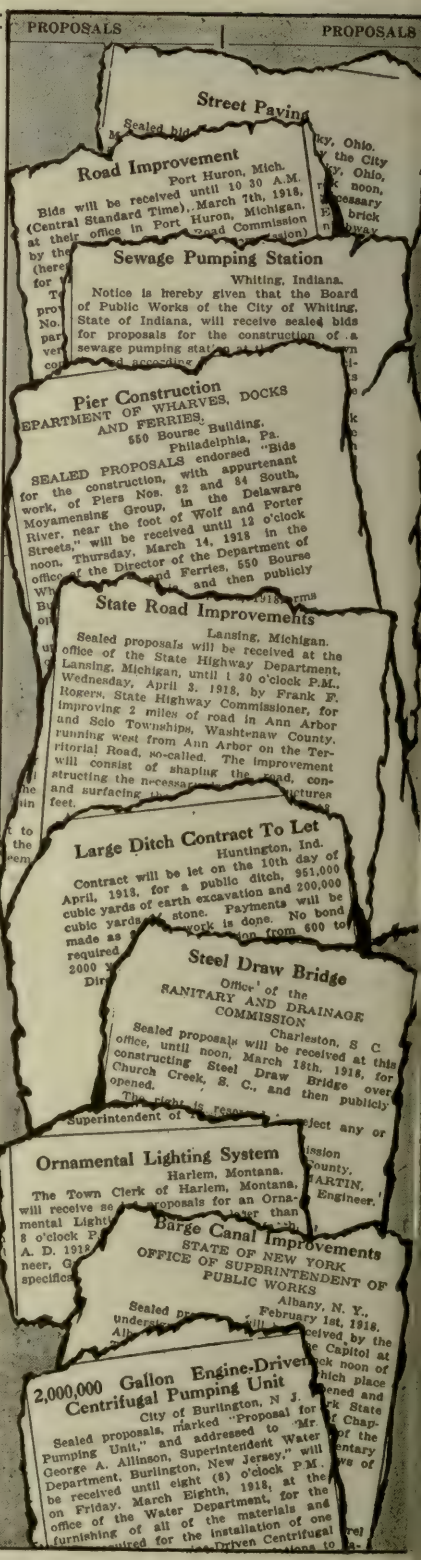
One Nationally Recognized Medium for Proposal Advertising

ADDRESS THE SEARCHLIGHT DEPARTMENT

ENGINEERING NEWS-RECORD

Tenth Avenue at 36th Street, New York

Chicago, Philadelphia, Cleveland, San Francisco



HAROLD S. BUTTENHEIM, Editor THEODORE R. KENDALL, Engineering Editor M. V. FULLER, Associate Editor

THE AMERICAN CITY

Published Monthly by The Civic Press, Tribune Building, New York—EDGAR J. BUTTENHEIM, President
HERBERT K. SAXE, Secretary-Treasurer—JAMES H. VAN BUREN, Advertising Manager
Branch Offices: Chicago, 327 South LaSalle St.—J. T. Dix, Western Representative
San Francisco, 320 Market St.—W. A. Douglass, Pacific Coast Representative
Entered at the Post Office at New York, N. Y., as second-class matter

Vol. XVIII CONTENTS FOR JUNE, 1918 No. 6

ARTICLES APPEARING IN THE CITY EDITION ONLY

The Housing of Munitions Workers..... 499
Man-Power vs. Machinery for Street Cleaning..... 502
The Parking System in Hillsboro, Texas.. 504
Fighting Fires in Ships..... 505
How Some Important Ship Fires Were Fought..... 507
Mexico City: The City of Palaces..... 509
Our Modern Moloch..... 515
Saving Coal by Efficient Street Lighting 516
The Government's Attitude Toward Building Operations..... 519
The Civic Work of Educational Institutions..... 520
Some Essentials in the Planning of School Buildings for Community Use

ARTICLES APPEARING IN THE TOWN AND COUNTY EDITION ONLY

America's Military Roads..... 499
Wake Up, America!..... 502
The Handling of Materials on Road Work 505
Methods of Repairing Bituminous Concrete Pavements..... 509
Repairs on Concrete and Brick Roads... 513
Rivalry in Road Maintenance in North Carolina..... 514
Highway Bridge Foundations..... 515
Colona Bridge: A Modern Highway Structure..... 518
Protection Against the Fire Menace..... 520
County Commissioners as County Leaders 521
The Need of a Centralized Federal Authority to Determine the Country's Highway Policy..... 522

ARTICLES APPEARING IN BOTH EDITIONS

Forward Steps Reported by Municipal Officials and Department Heads..... 523
Denver Drills Drafted Men
A Municipal Railway Tunnel to Aid City Development
Dayton's Community Country Club
A Chart Record of Street Department Work
The Planting of Public School Grounds
Bonuses to City Park Employes
The Parks of a Kansas Town
A City Chaplain
A Water-Supply Which Furnishes Power to Pump Itself
The First Municipal Motor Bus Line for Street Service
Investigating Fires Before the Evidence Is Destroyed
On the Calendar of Conventions..... 540
A Proposed Partnership Between the Improved Highway and the Parcel Post 541
A Research Bureau's War Service..... 545
What About Tuberculosis After the War? 546
Let Us Have a Worthy Observance of the Fourth..... 552
A Public Citizenship Day on July Fourth 553
Items of Municipal Law..... 554
Examples of Motor Apparatus in Use by Municipal Fire Departments..... 555
News and Ideas for Commercial and Civic Organizations..... 556
Food Conservation Signs on Wisconsin Capitol Building
Home Demonstration Canning Clubs
"A. Patriot, Grocer"
Literature on Food Production and Conservation
A Fine Halibut Market at Seward, Alaska
The Home Guard of Youngstown, Ohio
Merchants Close Their Stores Earlier
The Johnstown Chamber's New Home
Hazleton's War Work
A Representative Board of Directors
Farmer Memberships Secured
Salesmanship Introduced into the Public Schools of New Jersey
New Bulletins
Recently Issued Printed Matter
Changes Among the Secretaries..... 573
Restoring the Efficiency of Clogged Water Mains..... 575
After-War Problems of Reconstruction 581
"A Dangerous Year in Which to Be a Boy" 581
New Land Legislation Urgently Needed 583
Announcement of Prize-Winner in National Creed Contest..... 585
Coöperation Between Hotels and State Department of Health in Maine..... 587
Municipal and Civic Publications..... 589
Methods, Materials and Appliances..... 593

Two editions of THE AMERICAN CITY are published each month, both containing the same number of pages. The distinction in contents is indicated above. The subscription price of either edition is $3.00. For $1.00 additional per annum, any subscriber may receive both editions; or any subscriber may have his name transferred from the mailing list of the City Edition to that of the Town and County Edition, or vice versa, without extra charge. Canadian subscribers pay 50c extra per year to cover postage; other foreign countries $1 per year extra.

Back numbers of THE AMERICAN CITY are kept in stock by the publishers.

White Trucks

Hauling Dynamite for Use in Constructing the New Dam

HAULING SUPPLIES FOR NEW $17,000,000 DAM

MACHINERY, tools, materials, supplies and miscellaneous other essentials for the construction of the giant concrete dam built by the Pacific Gas and Electric Company across the Pitt River at Big Bend, California, were transported over the mountains in record time by a fleet of narrow-tread White 5-ton Trucks.

The trucks are owned by Jobe Lukens, a hauling contractor of Red Bluff, California.

The poor condition of the roads, th steep grades and the narrowness of th passes over which the supplies had t be transported, caused other haulin contractors to refuse the contract an gave the promoters grave concern.

Mr. Lukens states that his truck transported a steady stream of materi als daily to the site of the dam an enabled the progress of the construc tion to proceed without interruptior

The efficient and dependable service rendered by this fleet of White Trucks is characteristic of White performance on great construction and engineering projects everywhere.

THE WHITE COMPANY
CLEVELAND

Largest Manufacturers of Commercial Motor Vehicles in Americ

VOLUME XVIII
NUMBER 6

The American City

NEW YORK
JUNE,
1918

The Housing of Munitions Workers

What the Bureau of Industrial Housing and Transportation is Doing to Help

By Otto M. Eidlitz
Director, Bureau of Industrial Housing and Transportation, U. S. Department of Labor

THE dominating purpose of American life to-day must be winning the war. To win the war we must have guns and ammunition. To make the guns and ammunition we must have skilled mechanics and laborers. We cannot get nor keep workmen at any ordnance plant unless we can house them. The function of the Housing Bureau is, therefore, emergency service to war industries.

Many of the arsenals of America are in or near cities. In some cases they are increasing their forces, while the peace-time industries of these cities are operating with reduced force. Then the labor of the peace-time industries either works for the arsenal or moves away, leaving its houses available for the incoming workmen. Under such circumstances the housing problem solves itself.

A Canvass and a Registry of Vacancies

But the conditions are not usually so simple. The munition plants must often increase their force in a few months by several thousand persons, while other industries are running at practically full strength. The acute shortage which occurs or which threatens must be met by a canvass of vacant rooms and dwellings. In every normal city from one to five per cent of dwellings are vacant, but no central record of them is generally kept. In a city which has a shortage of accommodations, a registry of vacant dwellings naturally follows the canvass of vacancies. A publicity campaign is also necessary to get persons with vacant dwellings to register at once. And the list must be made accessible to the incoming workers at the arsenal or other war industrial plant, or at the railway station or other central point, if there are several expanding war industries in the city.

It is not sufficient to provide a mere list of vacant dwellings. The registry must have accurate information of the number of rooms, their equipment, their condition, the kind of district in which they are located, the rent, the distance from the factory, the car-fare, and so on. To have contented and efficient labor—we can win the war with no other kind—we must be able to fit the house to the man. A self-respecting family must be directed to a clean, wholesome house and not a filthy shack. A large family must have a house of probably not less than five rooms and not an apartment of two rooms. And in general each family must be helped to find the kind of house and residential district that it prefers.

About half of the workmen in our ordnance plants are unmarried. Lodgings must be found for these in private homes, or vacant buildings may be converted into hotels for their use. In most communities rooms which are both clean and private can be provided for every unmarried workman at slight expense, and with little or

INSPECTION CARD — ROOM AND BOARD.
WATERVLIET ARSENAL — HOUSING BUREAU.

Listing No._____ Date inspected_____ 191___

(Make sure all questions on cards are answered properly.)

Rooms { Furnished_____ / Unfurnished_____ } Total accommodations_____ Table board for_____ Total accommodations_____

NO.	STREET	PHONE	CITY	FLOOR

Number of bed rooms { Single_____ / Double_____ No. beds_____ } Private family_____ or Rooming house_____ Restaurant_____ or Dining room_____

How many can you accommodate_____ Room_____ Board_____

With accommodations for sleeping_____ Eating_____ Sex_____

Number of living rooms_____ What are they_____

Privileges_____ Bath room_____ Toilet in yard_____

What rooms do not have outside windows_____

Heated by_____ (What kind in each room)_____ Lighted by_____ Room rent per week: for 1—$_____ for 2—$_____

Table board per week, $_____ or a la carte_____ Is light included_____

Is heat included_____ Condition of the bath room_____

Bath is nearest what room_____ Water supply_____ Sewer connection_____

	REMARKS:
Condition of kitchen_____	
Condition of bed rooms_____	
Condition of living rooms_____	
Condition of exterior, including yard_____	
Condition of cellar_____	
Neighborhood_____	

Inspected by_____

INSPECTION RECORD CARD USED BY ALBANY CHAMBER OF COMMERCE IN ASCERTAINING AVAILABLE ROOMS AND BOARD, IN THE U. S. WATERVLIET ARSENAL HOUSING SURVEY

no delay, by patriotic appeal to the property owners of the city. Many families can take one or more roomers without depressing their own standards and without discomfort to themselves or their lodgers. They should be induced to help the Government in this way. But care must be exercised to prevent excessive crowding, for our purpose is defeated if we render living conditions so uncomfortably crowded that men quit their jobs or civic morality declines. The establishment of a registry of rooms and dwellings has practically solved the problem in four or five cities, and is an essential first step in all but the smallest communities.

Improved Transportation

In communities where the above methods do not solve the problem, the next step is to study the suburbs and neighboring cities which may have vacancies. A change of the train schedule, the provision of express trains, the building of a station near the factory, or some other adjustment in local transportation may make it possible to add a thousand or more workers in the plant. The services of our transportation agents have solved the housing problems of two or three cities and have helped to solve that problem in almost every city.

Building New Dwellings

There are some places that are so small or so crowded with rapidly expanding war industries that the local problem cannot be solved by registry supplemented by improved transportation. In these places dormitories must be built for the unmarried, and houses or apartments for the married, who bring their families. There must be wholesome places to live in, because dark, unsanitary houses reduce the workman's output. The dwellings must be safe

and convenient and sufficiently attractive and homelike, so that the workman and his family will be contented and will stay there. The labor turnover must be reduced to a minimum. These houses may be temporary or permanent. Dormitories may be constructed on a plan which will render them convertible into private residences after the war. In growing communities the salvage will be greater where this practice is followed than where houses are built to scrap. The estate must be planned, because careful planning means convenience and economy.

FURNISHED ROOMS STREET.....No.....
TELEPHONE.....

UNITED STATES WATERVLIET ARSENAL HOUSING SURVEY

ALBANY CHAMBER OF COMMERCE

Number of VACANT SINGLE rooms..... Price per week.....
Number of VACANT DOUBLE rooms..... Price per week.....
How many rooms available for light housekeeping.....Price per week.....
Bathrooms.....
Heated by.....Lighted by.....
Will furnish breakfast, dinner, supper.....Price per week.....
Remarks as to condition.....
.....
March.....1918
.....
Team Worker

Printed in Albany

FURNISHED ROOM RECORD CARD USED IN THE WATERVLIET ARSENAL HOUSING SURVEY

The Housing Bureau's Emergency Service

To conclude: We are in this war to win—and to win with the utmost speed. Everything must be sacrificed to this end. A Housing Bureau must not bend knee either to the Utopist with his plan of the City Beautiful nor to the profiteer who would charge exorbitant rents for unsanitary homes at the peril of his country. The policy of the Housing Bureau is rather to help the worker to find a satisfactory home thru its rooming bureau or thru transportation, and where these methods fail, it is to build as soon as possible a sufficient number of wholesome homes to house workmen not otherwise provided for.

Details of procedure for commercial and civic organizations establishing housing corporations are being changed, so that the Bureau prefers to make no statement of detail at this time. All requests for appropriations, however, should be submitted to the Director of the Bureau of Industrial Housing and Transportation.

At this time the Congressional Committee on Appropriations has not acted upon the special appropriations for construction in various localities. The Bureau, thru limited funds that have been made available, has made preliminary studies in places where the problem is most urgent. Thru the patriotic response of local citizens, room registries and improved transportation have already been provided in several places, and hundreds of thousands of dollars have been locally subscribed for new construction to match the prospective assistance from the public treasury. Because of these investigations and because of local coöperation, the Housing Bureau is prepared, when authorized, to act much more promptly than would otherwise have been possible.

EDITORIAL NOTE.—A pamphlet entitled "Standards Recommended for Permanent Industrial Housing Developments" has been issued (March, 1918) by the Bureau of Industrial Housing and Transportation of the U. S. Department of Labor, Washington, D. C. Applications for this pamphlet should be made to the Bureau.

Man-Power vs. Machinery for Street Cleaning*

The Man with the Broom Will Always Have a Place in Maintaining the Cleanliness of City Streets

By John F. O'Toole
Superintendent of Street Cleaning, Pittsburgh, Pa.

ONE of the most important questions at the present time for practical street cleaning administrators to consider is the use of new mechanical devices for street cleaning purposes, and the employment of methods of cost accounting. There are many street cleaning devices exploited in magazine articles and special circulars sent out by promoters or manufacturers giving account of work done by these machines and the cost of doing the work, but they do not show the variable conditions, such as weather, traffic, paving, etc., under which the work was done, nor the degree of cleanliness effected by these methods. Nor are there any data presented to show how these machines could be used by any large city to the total or partial exclusion of old-type machine brooms, flushing machines (horse or motor power) and other tried methods found by experience to accomplish good results.

Altho the area of work done by the older machines may not be comparable to that treated by machines of the vacuum or pick-up type, still, when the thoroness and simplicity of the older methods and machinery are considered, it does not seem to me that any administrator, who has for any lengthy period experienced the variable conditions that confront him during the ordinary progress of his work, would be in a great hurry to entirely discard tried equipment and install newer labor-saving devices without securing the fullest information as to the practicability and usefulness of these new devices. My experience has been that from time to time, thru well-meaning, over-zealous and often irresponsible persons, street cleaning apparatus such as that having the vacuum or machine pick-up principle is called to the attention of the general public by letters in the newspapers giving descriptions of machines in use in certain cities or towns, photographs of them, methods of operation and costs of cleaning certain areas. Many of these persons, no doubt, are animated by a progressive spirit and believe that their home city is not fully keeping up to the times in dealing with the street cleaning problem. Often the administrator is condemned for not supplying the more novel equipment that has met the eye of the tourist when visiting cities where the street cleaning problem greatly differs from the problem in his home town. It is always difficult to convince these people that proper consideration has been given to many of the much-touted magical, labor-saving, dirt-removing devices.

The Essential Hand-Sweeper

I believe that under favorable conditions a great deal of man-power can be done away with by the use of some of the mechanical pick-up devices, but I have not yet been convinced that under all conditions to be met in the many-sided problem of street cleaning it would be wise at this time to discard to any great degree the reliable man-power used in conjunction with present mechanical devices, until time has given the newer types of machines a greater opportunity to more fully demonstrate their usefulness. The average street cleaning official is not in position to properly weigh the many claims made for these new devices unless he is permitted to observe them in operation under every condition to be met in the average large city.

There is no doubt in my mind that there are certain streets and districts in nearly every city where, under ideal weather conditions, many of these labor-saving devices could be worked to advantage; but just as soon as conditions were such as to prevent the best results from the use of these machines we should have to be satisfied with the measure effected or else have recourse to other methods to properly carry on the

* From a paper prepared for the Society for Street Cleaning and Refuse Disposal of the United States and Canada.

TYPE OF HAND-WAGON IN USE BY PITTSBURGH STREET SWEEPER

work. If there were any appreciable reduction in man-power used in connection with new devices it would be necessary to recruit a new labor force to fill in until there was opportunity to again place the new machinery in operation. The prompt recruiting of a labor force for temporary employment and the likelihood of securing immediate results from such a force does not appeal to the practical mind. It might be said by promoters of certain types of pick-up machines that during the summer months man-power could be appreciably lessened by the use of these machines and that when the months during which unfavorable weather could be expected had arrived the old system could be invoked and thus a great saving of labor cost would result.

Now, let us analyze this proposition: In the first place, the objection of laborers to accepting temporary employment would have to be met. During periods of business depression we should no doubt be able to secure sufficient numbers of men to engage in this work, but it must be borne in mind that untrained men are not of much value and that only those not able to secure permanent employment or others who are unfitted for steady work would be the ones to be attracted by this proposition. Such

STREET FLUSHERS IN USE IN PITTSBURGH

men would be constantly on the lookout for permanent positions, and little dependence could be placed upon such an organization in an emergency or when stimulated business conditions would make a call upon their services elsewhere. Man-power, used in cleaning streets in cities where there is a combination mechanical sweeping and flushing system in operation in conjunction with the block or push-cart man, might be criticised as costly when compared with reports from efficiency experts and others showing a low cost of operation for mechanical pick-up devices; but these reports do not take into consideration the average elements in practical street cleaning which would be noted in the daily experience of a 365-day period, nor do they disclose the measure of cleanliness effected at all times.

Objections to Mechanical Devices

Many conditions could be cited under which no known mechanical pick-up device could provide the degree of cleanliness that modern city life demands. In the congested business sections of any large city the traffic conditions are such during the major portion of a 24-hour period that no mechanical device can insure satisfactory service.

This in a measure would also hold good in many high-class residential sections, especially since the general use of the automobile, where street after street is occupied temporarily by these autos for parking purposes during many hours of each day. While it might be said that in sections such as this and other more remote residential districts the work of cleaning streets could be performed better during the night, there again we are met with objections from residents who complain that their evening's recreation in the vicinity of their homes is destroyed during these operations, and if operations are suspended until a later hour, objections are again entered by these people on account of our disturbing their slumbers.

All of these conditions indicate that the man with the broom cannot be entirely done away with, and that no matter what mechanical devices are used, we must rely upon this man-power to maintain at all times an efficient street cleaning organization. The modern standard should provide for the constant cleanly appearance of the street, and this standard cannot be maintained by mechanical devices alone.

Pick-up devices, under favorable conditions, will no doubt lessen the cost per cubic yard of material removed and also lessen the cost of area treated, but what I have endeavored to make clear is that there are so many factors to be considered in the problem of cleaning and keeping clean the streets in a large city that any reduction in the cost of doing this work by appreciably lessening the man-power, especially in the patrol service, would be balanced at times by the unsatisfactory measure of cleanliness effected.

The Parking System in Hillsboro, Texas

Courtesy of The Dallas News

An ordinance requires automobiles to be parked in the center of the street, to drive in and out from the right, and to travel at all times on the right side of the street. No cars are allowed to park next the curb or to stand there longer than ten minutes. The plan is an unqualified success, adding greatly to the city's appearance, and is the means of avoiding many accidents.

Fighting Fires in Ships*

By Edward J. Shallow
District Chief, Boston Fire Department

FIRE CHIEFS are entrusted with a duty almost as important as that of the fighting forces. To them is given the defense of the home and the wealth of the nation; to them the task of keeping open the marts and lines of travel. Before the war we were an unsuspecting people, pursuing our way in peace and contentment. We have found our country overrun with spies, murderers and incendiaries, we have found work in our shops ruined, strikes fomented by foreigners and foreign money, and our railroad and shipping delayed. In fact, we have found in our midst an organized force of the enemy, doing anything and everything to hamper, delay and distress us.

Every conceivable weapon has been used against us, but the safest, surest, most easily applied, and, at the same time, the most terrible and terrifying, and the one that has done the most damage, is "the torch." But fortunately "the torch" has a powerful enemy which cannot be resisted when it is used skilfully, scientifically, by trained and courageous men—water. That is the answer to the alien incendiary—water. And the fire chiefs and those under them are the trained, courageous, skilled men to use it. It is at this time their sworn, solemn duty, even should it lead to death, to fight this terrible enemy, to protect the lives and the wealth of the nation.

The Importance of Ship Conservation

To supply the needs of the army of our sons and brothers and friends now in Europe, ships are a necessity. Every energy is being strained to the utmost to supply this need. The shipyards are doing well, but the cry is—*Conserve.* Of course a fire loss is a detriment to a community. Insurance does not make good that loss; it simply pays money for what was destroyed. It does not reproduce the burned articles; they are gone—a loss. Every part of a building and its contents saved is a gain to the community. If that be the case, how much more important it must be now to save every possible part of a ship or its contents, when they are so badly needed! Every plank saved means so much labor, so much new material, which again means labor, so much delay in the use of the ship while it is being repaired. So, save ships, save parts of ships, save all the delays in using ships, by getting to marine fires as quickly as possible, and be free with apparatus and men. No matter how small a ship fire may appear, it should be treated as an incipient conflagration.

Fighting Fires at Sea

The fighting of fires at sea by crews does not come within the scope of this paper. But there are matters in relation to this subject that the new ship-building program forces us to take into consideration. Every chief and every officer from a seaport is more or less familiar with sail and steam craft and their construction. But we are now being confronted with new types, not only of wood and steel, but also of concrete, of large size, and equipped with various new devices. Also, electricity is coming into use for propulsion, which adds a new complication. To keep fully up to the times would require a course in naval construction. Under the new way, the Government is standardizing ships—that is, making as many interchangeable parts of a ship as possible, so that, should a ship need a new part, any yard or shop could furnish that part without delay and at a minimum expense.

This should tend to a great increase of the Merchant Marine, and we shall later find ships of certain size and speed, designed especially for certain trade routes. Fortunately, these plans have not yet been worked out to a definite conclusion where they could not be changed without much labor and confusion, and the thought arises, if it be feasible, why should not the Government, by some action, take from the shoulders of sailors and firemen, the exclusive burden of fighting fires on ships and place some of it where it belongs—on the owners.

On war vessels the officer of the deck, by looking at a dial on the bridge at any

---

* From a paper presented at the convention of the International Association of Fire Engineers, held in Chicago, June 4-6, 1918.

Copyright by Underwood & Underwood, N. Y.
FIRE AT A BROOKLYN, N. Y., PIER, WHICH DESTROYED SHIPS LOADED WITH MUNITIONS FOR THE ALLIES

time, knows the temperature of magazines, bunkers, etc. What an advantage to a merchant captain that would be! How much quicker a chief could get to work, if, on arrival, he was told just where the fire was located. Let us say that there are certain sizes of standardized ships. Why should Congress not pass a law that owners must install devices to locate and control fires? Why not a sprinkler system and stand-pipes? Perfectly feasible; a simple mechanical difficulty. It can be done, and at a cost not excessive. If good on land, where help is quickly available, at sea, with an untrained crew and a possible storm, it seems to me they would be invaluable. Why should not every available means to locate and combat fire on ships be taken advantage of by owners and underwriters? Conservation is the word now, and will be after the war, and such action should tend to greatly cut down marine fires and save ships, and maybe at times, life.

Fighting Ship Fires Near Shore

This brings us to the second part—the fighting of fires aboard ship at wharves or in harbors, by city departments. The method of fighting fires on shipboard is determined in a great measure by the cargo, whether the ship is partly or wholly laden, and how great a start the fire may have before the arrival of the apparatus. It is assumed that the fire must be fought almost wholly from the hatchways or from holes cut in the deck, in the case of a wooden vessel.

On arrival, the first care is to locate the fire, find what the cargo consists of, and how the ship is laden. This is usually obtained from the ship's officer in charge. If he is unable to give this information, the fire chief must be guided by the volume of smoke arising from the ventilators, and the heat on the adjacent parts. By these signs a shrewd guess can be made, but it is only a guess, and the chief may be mistaken. He then removes the covers of one or more hatches, as he thinks necessary, and turns the streams from fireboats and steamers into the hold. It is obvious that in only very rare cases are men ordered into the holds, and in the case of explosives and certain goods and chemicals that generate noxious fumes and gases it would be impossible for men to enter. If the ship is loaded to the hatchway, the ship must be flooded to the point of the fire. If the ship

is partly loaded, the streams may put out the fire on their way down, if the volume is not too large. But it is safe to say that in this case, also, the ship must be flooded to the point of contact with fire. As stated above, where fumes arise, the ship must be flooded at a safe distance, to avoid loss of life. In some cases it is advisable, where it can be done, to open sea-cocks, break ports and scuttle the ship, which is practically flooding it. Unlike in the case of fires ashore, there is little or no chance to remove the cargo and get at the actual seat of the fire, and it can be subdued only by actual weight of water, or flooding.

This brings me back to my suggestion as to the use of sprinklers and stand-pipes. I believe their introduction on ships is necessary, is imperatively demanded now, and I offer as a suggestion that a committee be appointed to draft a bill, to be placed before Congress and backed by the International Association of Fire Engineers, that the underwriters should aid by men and money; that their staff of clerks, engineers, etc., should take all the labor from us, and ask only our aid as firemen, and men from whom such a measure should come, it being our particular province. The bill should call for the installation of apparatus to locate and extinguish fires on shipboard; it should be mandatory and carry a sufficient penalty to prevent evasion; it should include all new ships above certain sizes. Of course, it will cost the owners something, but if the underwriters reduce insurance rates ashore for much apparatus installed, they will be glad to do so on ships, and it will equalize itself. It means work for some; it needs working out; it is crude; yet it can be worked to a conclusion satisfactory to all.

How Some Important Ship Fires Were Fought

By Edward J. Worth

Deputy Chief Commanding Marine Division, New York Fire Department

In an interesting paper on "Fire Fighting in Vessels—Special Tools Needed," presented at the recent convention of the International Association of Fire Engineers, in Chicago, Deputy Chief Worth describes the methods used in combating a number of important ship fires. Two of these instances are described as follows:

Use of Oxygen Cutting Torch

THE steamship *Conastoga,* of 8,000 tons, was loaded with a general cargo in the two holds and after 'tween-decks compartments, extending almost to the stern of the ship. In loading the 'tween-decks the tiers of cargo were topped off with cakes of parafine wax wrapped in burlap. The fire originated in this wax from some unknown cause, melting it and causing the burning wax to run down among the cargo, igniting everything below.

The fire was showing in number 3 and 4 hatches, to which point lines of hose were quickly stretched to prevent the fire from spreading to the piers. Streams were also directed to bulkheads on both sides of the burning compartment, and the clamps were removed from doors leading from the main to the 'tween-deck compartment, which was also threatened by the fire. Lines of hose with open butts were stretched to this compartment and water started, flooding it to the top of the door sills. This prevented the fire from igniting the cargo resting on steel decks over the seat of the fire.

In the compartment directly forward of the one on fire were stowed 4,000 cases of gasoline with a ½-inch steel bulkhead between. It was absolutely necessary to keep this bulkhead cool at all hazards. This was done bystretching two 3½-inch lines of hose from the boat's turrets to the deck of the ship; two 3-way gate connections (3½ inches to 2½ inches) were connected to these lines, six lines of 2½-inch hose with 1¼-inch nozzles were stretched from these connections, and the water was started for the purpose of cooling down the bulkheads, the deck plates and the sides of the ship, which had began to buckle from the intense heat caused by the burning wax.

The oxygen cutting torch was put to work, and about ten small holes were burned in the deck over the fire, and

streams of water from distributers, cellar pipes, were directed thru these holes to extinguish the fire in the 'tween-decks.

The ship's steam wenches were used for hoisting out part of the cargo for the purpose of overhauling, and to complete the work of extinguishing the fire.

In my opinion had it not been for the oxygen cutting torch it would have been almost impossible to check this fire without flooding the entire compartment.

Sinking the Ship in Shallow Water

The steamship *Preston,* of 5,000 tons, was anchored north of Liberty Island. Fire broke out in the forward compartment, which comprised No. 1 and 2 hatches; there being no bulkheads between them, the fire followed the line of the foremast up from below. The compartment contained a general cargo, and the fire extended to the coal bunkers, which were in the wings of the ship, separated from the cargo by wooden bulkheads.

Lines were stretched from the fireboats to the deck of the ship; the ventilators on a line with the wooden bulkheads were removed, and the lines with distributers attached were dropped down to prevent the fire from spreading any further aft. Additional lines with controlling nozzles attached were stretched to the hatch openings and directed to the wings of the ship and on a line with the foremast, where the bulk of the fire was.

We removed the ventilators at the forward end of the compartment on fire, and lines of hose with spherical nozzles attached were dropped down thru the openings in order to prevent the fire from extending thru the water-tight iron bulkhead into the fore-peak of the ship, which was occupied as paint lockers, chain lockers and sailors' quarters.

In spite of the strenuous efforts to cut off the fire, it was found that it was extending and threatened the destruction of the ship. It was then decided to raise the anchor and move the ship to the south of Liberty Island, where there is shallow water with a soft bottom, for the purpose of flooding the hold.

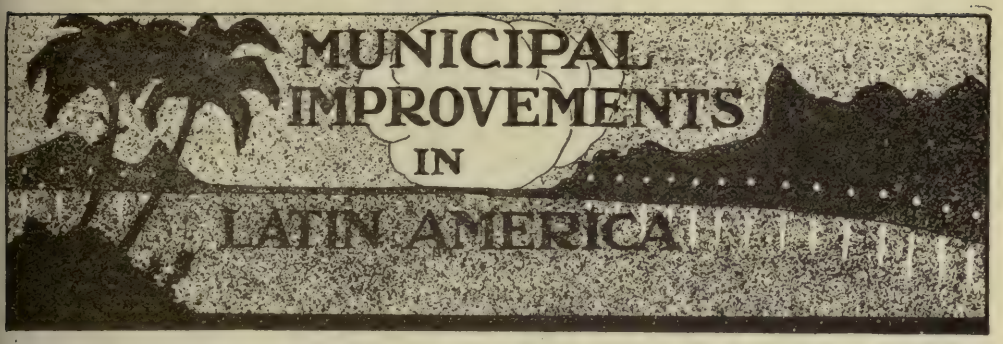
The ship proceeded under her own steam, assisted by the fireboats, to the beaching grounds and dropped anchor in four fathoms (24 feet) of water, which was sufficient under the keel of the ship to allow her to settle at mean tide, leaving her main deck awash. Additional lines were then stretched from the fireboat to the open hatches of the compartment, using 3½-inch open butts. Water was started, flooding the compartment in a comparatively short time. The ship settled down in the soft mud bottom, leaving the coamings of the hatches just above water, and extinguishing the fire thruout the ship.

It was absolutely necessary to put this ship down, owing to the lack of bulkheads to stop the fire and to save the ship from destruction and salvage the cargo. The ship was pumped out by a wrecking company and was discharging the damaged cargo in 15 hours after the fire.

Among the valuable appliances needed in fighting ship fires are the smoke helmets. These have enabled firemen to enter the holds of vessels which were heavily charged with smoke and fumes, and to do good execution with a 2½-inch line—in many cases extinguishing the fires.

The value of the oxygen cutting torch has already been mentioned. It is very often necessary to cut holes in the deck plates and bulkheads of ships to admit distributers or cellar pipes, especially where red heat shows and when it is impossible to send men into the hold to direct streams between the cargo and deck plates, owing to the intense smoke and heat and to the stowing of the cargo close up to the deck plates.

Hook ladders for hanging on the rail of a vessel or over the hatch coamings; tower pipes, acting like water towers at land fires; rail pipes for holding a stream at any desired angle on fires under piers and in floating debris, and for cooling the sides of burning vessels; the three-way gate connection for the independent control of several lines of hose; pipe holders for handling heavily charged lines of hose; rivet cutters; spray nozzles for wetting down fibre cargoes; powerful search lights, and electric hand lights—these are indispensable tools in marine fire-fighting.



Under this heading is being published during 1918 *in* THE AMERICAN CITY *a series of articles on Central and South American municipalities, thru the courtesy of the Pan-American Union. The Pan-American Union is the international organization, with headquarters in Washington, D. C., maintained by the twenty-one American republics for the development of good understanding, friendly intercourse, commerce and peace among them. The next two articles of this series will deal with municipal conditions in Bogota, Colombia, and La Paz, Bolivia.*

Mexico: The City of Palaces

THE journey to Mexico City may be made by various routes overland or by water. If one passes southward overland from the United States to Mexico, a long and rather tedious railway trip lies between the border and the capital. By railroad from Vera Cruz to Mexico City, the route is wonderfully varied—a road that taxed engineering talent as well as the coffers of its promoters. The distance to Mexico City from the four points on the Rio Grande varies from 860 to about 1,200 miles, while from Vera Cruz to the capital the railroad distance is 263 miles. There is also the well-known rail connection from the Mexican capital to Guatemala, and to various Pacific and Gulf of Mexico ports. The city is the terminus for six railways.

The stranger traveling from any direction toward the City of Mexico, upon reaching the central plain, finds among the country's striking features the universal cultivation of flowers and the vast fields of maguey. The former are to be had during the entire year, and of such a multitude of varieties as to please every individual taste. The latter plant produces the national drink of the masses; so flowers and pulque are at least two commodities to be found on every morning train for Mexico City.

Mexico's Pyramid of the Sun, altho today its apex stands slightly more than 200 feet above the surrounding country, provides a favorable point from which to view the valley in which Mexico City lies. The pyramid of the sun, the greatest of its kind in the western world, may be said to be analogous to Cheops, which overshadows the valley of the Nile, a few miles from the chief city of Egypt.

The Ancient City: Its Surroundings and Climate

A view of Anahuac, or the valley of Mexico, as modern peoples know this picturesque region, reveals at present a somewhat changed surface; and only a few large lakes are left of what in prehistoric years may have been an inland sea dotted with islands. This valley of Anahuac, about 60 miles long and 30 miles wide, is surrounded by mountains, some of whose peaks are constantly capped with snow, while in the lowlands tropical fruits and flowers are features of vegetable life. The altitude of this valley varies from 5,000 to 8,000 feet, and there prevails, consequently, a climate of perpetual spring, the thermometer registering a mean annual temperature of about 59° F. in the vicinity of the capital. May is the hottest month of the year, with an average temperature of 64° F.; December is the coolest, the average of the thermometer being about 53° F. Be-

A STREET VISTA IN MEXICO CITY

tween these months the Mexican valley experiences its season of rains, which, beginning with the warmer May days, gradually grow to maximum and diminish by the end of autumn. The change in temperature varies only a few degrees during the year, but is especially marked between sun and shade and between night and day. Usually in Mexico City the midday sun is hot, but the shade is rather cool; with the coming of darkness the air cools quickly and light wraps are comfortable.

In 1325 Tenochtitlan, or Mexico City, was founded by the Aztecs. This event occurred nearly 200 years before Cortez arrived on the scene. Passing over many years of stirring events, and various eras of primitive construction, we find that the Aztecs had attained a high state of splendor when the Spaniards came to invade the country. History shows that the place had from 50,000 to 60,000 houses, a population of something like 300,000, and a circumference of about 12 miles.

The chief of the Aztecs, the first Montezuma, died about seventeen years before the arrival of Cortez and his fellow-adventurers. Montezuma II was ruling over the Aztecs when the Spanish invaders reached the present site of Mexico City, after a long and memorable pilgrimage from the shore of the Gulf of Mexico. Their surprise must have been great when they first beheld the Aztec capital, for the city is described as having been in a high state of development, but of an entirely different nature from that of European civilization. The splendors of the city and its evident wealth and luxury doubtless first aroused in the Spanish adventurers the desire to dispossess the Montezumas and to conquer the country.

The Municipal Government

Passing over the days of the Spanish conquest and coming down to the present, we find Mexico's capital located in a Federal District of 579 square miles. The city proper covers about 15 square miles. For administrative purposes this district is further divided into 13 municipalities, of which Mexico City is one. At the head of Mexico City's government is a superior council composed of the Governor of the Federal District, the Director of Public Works and the President of the Board of Health. All are appointed by the Chief Executive, but they act under the Department of the Interior of the Nation. The Governor is the political authority, and he enforces laws and decrees, commands the police, the fire department, etc., and is charged with the operation of public utilities, the inspection of weights and measures, etc. The Director of Public Works looks after the water supply, streets, parks, lighting the city, markets, and allied activities affecting the public; while the duties of the President of the Board of Health are indicated by the title of the

office. Each of the three officials is separately responsible for the conduct of his department of the government. Sitting together as the Superior Council, they may annul or revise the action of any one of the constituent members thereof. The Department of the Interior may annul or revise the action of the Superior Council itself.

Each of the 13 municipalities has also its own *ayuntamiento,* or local council, composed of men elected by popular vote for a four-year term. A councillor must be at least 25 years of age and a Mexican citizen.

Public Works and Streets

Probably the city's most important municipal undertaking has been the construction of a canal to drain the valley in which the city stands. Begun in the 16th century, it was many years in course of construction. A special board renewed efforts in 1886 and carried the enterprise to consummation by 1900. We have referred to the valley as having no natural outlet; by drain pipes, canals and a tunnel, however, the surplus waters of the valley and lakes, as well as the underground sewerage of the capital, are carried beyond the encircling hills and mountains. A water-works system, utilizing the springs of adjacent mountains, supplies the city with an abundance of pure water and also flushes the canals, aided partly by mechanical pressure. The whole system has cost the municipality more than $5,000,000.

Mexico City's streets run north and south, and east and west, with many new and broad avenues that offer interesting contrasts to the narrow streets, or *callejons,* constructed in former eras. They are usually level, and the newer ones are well paved or constructed in accordance with modern street paving methods; on older streets the long popular cobble stones are still to be seen. The beautiful avenue known as the Paseo de la Reforma, stretching about three miles from the city proper to the Hill of Chapultepec, is a model of its kind. Many of the world's avenues were examined and studied by a Mexican street commission, and numerous points of utility or excellence were adopted for the Paseo de la Reforma. Along this unusually broad avenue are half a dozen or more great circles or *glorietas,* in some of which magnificent statues have already been erected, while on the sides at intervals are placed smaller statues of modern or historical heroes. A double line of beautiful eucalyptus and other trees add shady patches here and there along the course, and there are attractive private lawns and flower beds on either side.

The streets of Mexico City are somewhat puzzling to the stranger. For instance, Calle San Francisco, now the Avenue Francisco I. Madero, always a popular thoro-

STATUE OF CARLOS IV, AND THE PASEO DE LA REFORMA

fare with native or guest, had different sections, as 1st San Francisco, 2nd San Francisco, etc., according to the location of a certain block. This ancient system was changed a few years ago, and all streets from east to west were designated as avenues; those running north and south, streets or *Calles,* and in each case a single name was bestowed on the entire thorofare. Legend and tradition are strong, however, and many people appear to prefer the older order of street designation, except in the cases of some of the new avenues. Mexicans also cling to patriotic names, like Calle Cinco de Mayo, for instance, which is the date on which they won a victory over the French (May 5, 1862) at Puebla. We also find the Spanish equivalent for such streets as Illustrious Men, Sad Indian, Walking Priest, Lost Child, Bridge of the Raven, The Watch, etc. There are nearly 1,000 streets and "lanes."

Views of the City

At the outward end of the Paseo stands the castle of Chapultepec, constructed on the crest of a high natural bluff, from which one may enjoy a magnificent view of the city and surrounding region. A winding roadway leads from the lower level to the top of this "Hill of the Grasshopper," as it is called; and on stones along the route are figures and heiroglyphics made by the Aztecs or their predecessors. At one point on this road we pass a cave-like opening which is the entrance to an underground passage to the top of the hill, said to have been a secret route of ascent in olden days. This interior passage is now closed to visitors, but years ago an elevator was constructed in one part of the passage, which has been frequently used by the presidents.

Once upon the crest of Chapultepec, 200 feet above the city, the traveler is charmed, not alone by the views, but by the way nature and man have combined to produce the unusual, the interesting, and the picturesque. On the Pyramid of the Sun, of which we have spoken, all is ancient work; on Chapultepec stands a great modern castle and fortress, a portion of which has long served as the summer residence of the President of the Republic.

From Chapultepec we have what might be termed a close view of the capital city—much closer than from the pyramid's crest. At the immediate base of the hill stands the Bosque, or forest of fine old cypress trees overshadowing miles of drives and walks, with here and there hanging baskets of moss and vines arranged by nature herself. On the edge of this historical setting the Chapultepec restaurant has been erected, and so popular has this resort become that in late afternoons or evenings the élite of capital society may be found there sipping the tea of the Orient, domestic chocolate, or partaking of some of the best food to be found in the city. Dashing here and there are motor cars and carriages, while many pedestrians are out for pleasure and recreation.

Sight-Seeing in the City

To the stranger the ancient structures of Mexico City are far more interesting than those of recent date. The site of the Aztec ruler's temple is occupied by the present cathedral, a massive structure of gray stone and white marble, 374 feet long and 198 feet wide, containing marble altars, silver rails, and priceless paintings and tapestries. Another side of the Plaza Mayor is occupied by the National Palace, the official home of the President of the Republic and various other government officers. Over the main entrance hangs the liberty bell of Mexico, which was rung in 1810 by Hidalgo to call his fellow-countrymen to arms.

Volumes have been written about the National Museum of Mexico City. It is one of the world's greatest storehouses of aboriginal art, and scholars from every part of the earth have visited this vast collection.

A visit to Mexico City's floating gardens, or more properly speaking to La Viga canal, is a memorable experience, especially if the trip be made on Sunday. It is time well spent if one would know the humbler type of Mexican, catch a glimpse of his life and propensities, and note his skill as a flower producer and salesman. Mexico City, as we have observed, lies near several lakes: Zumpango, Xaltocan and San Cristobal on the north, Texcoco on the east, while Chalco and Xochimilco lie south of the city. La Viga and other canals connect lakes and city. It is on these waterways that so many flowers grow, hence the name of floating gardens seems quite appropriate.

IN THE ALAMEDA, MEXICO CITY

Amid flower-bedecked boats passing and repassing, the boatmen pole their visitors along this unique water course; sometimes for a few extra centavos a guitar player and singer may be engaged, thus adding a romantic feature to the Venice-like experience.

The architecture of Mexico City ranges from the very ancient to the most modern construction. After the arival of Cortez, the buildings gradually assumed a Spanish-Moorish style. As the years passed, Spanish architecture replaced other kinds with modifications to suit climatic or special conditions. During the rule of Maximilian modernizing influences were marked. There is a general absence of cellars on account of the marshy nature of the region; chimneys also are somewhat scarce, as the climate does not require heated houses. Re-

AN AVENUE IN CHAPULTEPEC PARK

cent years have seen the construction of several modern office buildings, a few of which might be termed the "skyscrapers" of Mexico. Naturally, these business structures have been placed in the most active commercial parts, most of them being within a short distance of the Alameda or the Plaza de la Constitution, familiarly known as the Zocalo. Many very modern and beautiful residences have also been built in recent years, both in the city proper and in suburban districts.

THE CATHEDRAL, MEXICO CITY

Educational and Commercial Features

The National Library, with its 200,000 volumes, the University with more than 20 allied institutions of higher academic and professional training, and at least 600 high and primary schools, give one a fair idea of how well the capital's youth are looked after in the way of educational advantages. The National School of Mines, erected in 1813, cost $200,000 and has been a power in the field of education. For those engaged during the day a number of night schools are operated.

The field of journalism is well covered by the publications of the capital, there being registered about 225 different newspapers and magazines, with normally 10 daily papers. The leading dailies print a liberal amount of telegraphic news from all parts of the world, and the illustrated feature of magazine-making has grown to a high degree of excellence.

Mexico City cannot yet be termed a great manufacturing center, but rather a city in early stages of promising factory growth. Numerous tanneries produce fine grades of leather, which is turned into a hundred useful articles by the expert Mexican leather worker. Cotton manufacture in the republic has grown largely in recent years, and in the capital city large supplies are annually placed upon the market from ten or more local mills operated by modern machinery. That which is said of cotton manufacture is also true of the making of woolen cloth, shawls, blankets, etc. Mexico

City also has a linen mill; and in suburban towns or near at hand is produced the bulk of news print paper used by the printing establishments of the capital. Within the Federal District are many cigar and cigarette factories. One of the city's newest industries is that of aeroplane construction, an enterprise that has already produced a number of machines for commercial and other purposes. These machines are now being built entirely by native mechanics at the aviation school and shops of the capital, and several improvements are reported to have been devised by the constructors. An abundant supply of electrical energy from the Necaxa Falls, which were first developed about 15 years ago, furnishes the power for the city's lighting, tramways, etc. Additional improvements are expected to generate 200,000 horse-power, and Mexico City as well as other neighboring communities will doubtless respond more freely to the call of the factory

Public Welfare

A score or more of public and private hospitals are in operation in the capital city. The General Hospital, completed in 1905, is of very modern construction and equipment. It has 28 or more "pavilions" and can accommodate nearly 1,000 patients. There is also a large and well-equipped hospital for children; this institution is nonsectarian and is capable of taking good care of at least 1,000 children. Those who are poor or needy are taught useful arts or trades so that they may be self-supporting and of service to the country. There is also a hospital for the use of railway employes, and the English, American, Spanish, French, and other colonies have their own hospitals and sanitariums.

Mexico City has a well-organized body of police. Every important street crossing or traffic center has its special officer. One of the rather unusual features of the system is the lantern which forms a part of each officer's equipment. At night as one looks down a street, a row of low middle-street lights stretches away in the distance, and to the stranger this appears a unique part of vigilance. On many of the most important avenues and streets the mounted officer is always on guard. In the city, on special holiday occasions, one sees troops of the world-famous Rurales brought in from their posts of duty. These men are among the world's most picturesque horsemen, with large sombreros, often completely leather-clad bodies, superbly equipped, and mounted on fine horses.

Numerous signs point to an era of better days in Mexico. Among the influences for good let us not underestimate the power of women in assisting Mexico to work out her social and political problems. The women of Mexico are becoming more interested in the country's welfare and development, and their activities are constantly assuming wider scope.

Our Modern Moloch

Moloch was the product of the imagination of the Ammonites. To this ancient people he was so vivid that they imagined the sacrifices which he demanded for his propitiation. The sacrifice was of little children, "made to pass thru the fire."

The report of the Cincinnati Health Department for 1917 shows that the greatest cause of death to children, between the ages of two and five years, was not the germ. Respiratory and intestinal diseases were relegated to a minor place in the grim schedule. The automobile stood forth as Moloch, which, more like a Juggernaut, passed over the bodies of children.

What our imagination in this material age would be incapable of conceiving, we have devised with our hands. Out of iron and steel and rubber we have contrived a thing of pleasure and utility that is convicted by our mortality statistics. It is the duty of society to meet this new condition which society has created. We ask children to play near and to traverse highways that have the safety of railroad tracks. More playgrounds and still more playgrounds must be provided, and restrictions must be put upon the traffic of certain streets until the automobile shall cease to be classified as a menace to child life. For even the coldest statistician will tell you that the life of a child is of more value to a community than the costliest automobile.—From *The Cincinnati Times-Star.*

Saving Coal by Efficient Street Lighting

By Gilbert T. Dunklin

WHILE the coal shortage experienced during the winter months is still harrowingly fresh in our memory and plans are being made for the conservation of the 1918 supply, the time is opportune to consider means for increasing the efficiency of every coal-consuming device. Indirectly, one of these is the electric lamp. Except in those communities served by hydro-electric power, every lamp when burning represents the consumption of just so much fuel. The amount required for each lamp is comparatively small, but the aggregate is large. Anything that may be done to increase the efficiency of necessary coal-consuming devices must be considered.

The amount of energy used for street lighting is directly or indirectly within the control of the city officials. With them rests the responsibility of conserving the coal supply by eliminating wasteful methods. But to what extent should street lighting be curtailed to meet the national emergency?

Appearance of Street Lighting Post Before and After Changing from Old-Fashioned Cluster Style to Single-Lamp Style

Why Streets Must Be Lighted

Street lighting is a necessity. Correctly done, it may be regarded: first, as a protection against accidents; second, as a means of lessening crime, safeguarding life and property and facilitating rapid transit on the streets at night; third, as a stimulus to civic welfare.

Improved street lighting methods have increased the use of the streets at night; the automobile has stimulated traveling, and the motor truck, which has proved extremely useful since the war, has congested traffic on many important business thorofares. Therefore, adequate street illumination is essential for the purpose of protection against accidents.

The very earliest forms of street lighting were used for lessening crime. During late years, however, other purposes have often secured preferred attention; for example, cluster lighting for display purposes, which is unnecessary and wasteful. This kind of lighting can and should be replaced with modern and efficient methods, which will give the same or better results at a lower cost for electrical energy and attendant labor charges.

How to Reduce Cost and Maintain Efficiency

Since nearly all street lighting is essential to the public welfare, the questions are:

(1) How can the consumption of electrical energy be reduced to save coal without lowering the present standards of illumination?

(2) What is the best system to install in place of existing wasteful and inadequate systems? Which is the most economical to operate?

Fortunately, the answer in either case is a simple one. Such rapid progress has been made during the last few years in the development and manufacture of incandescent lamps that the Mazda "C" lamp with improved types of fixtures lends itself to the solution of practically every street lighting problem.

Consider what has been done in the city of Chicago during 1917. The Department of Gas & Electricity found the cost of ma-

THE CONFUSING EFFECT OF CLUSTER POSTS ON THE ORDINARY STREET

terial and supplies steadily increasing. A study was made to determine some means by which the operation and maintenance cost might be reduced and the lighting service maintained at the existing standard, or improved.

(1) Part of the system in Chicago consisted of 10,000 type "W" 10-ampere, flame-carbon arc lamps. When this part of the system was compared with another burning 600-c.p. Mazda "C" lamps, it was found that by changing the 10,000 arc lamps to 10-ampere Mazda "C" lamps, a saving of $168,000 per year would be effected.

(2) The illumination given by the Mazda "C" lamps compares favorably with the old arc lamps.

(3) It was found that no additional funds would be required to cover the cost of changing the system. The difference between the cost of the new type of fixture for burning Mazda "C" lamps and the scrap value of the old arc lamp would be saved in 21½ days. The revamping of the system, therefore, would be absorbed by the saving in operating expenses.

The change was made from arc lamps to Mazda "C" lamps. For the latter, a new type of fixture made of cast iron, simple and rugged in the construction of all detailed parts, was selected. The cost of this fixture is very little more than the scrap value of the arc lamps, many parts of which were made of expensive materials like copper and brass.

Chicago's Saving in Coal and Labor

The saving made by the Department of Gas & Electricity of the city of Chicago was estimated at $168,000 annually, or $16.80 per lamp per year. Itemized, the amount saved would show certain points of particular interest at this time:

(1) *A saving in coal.*—The arc lamps

A STREET IN WHICH SINGLE-LIGHT UNITS WITH TRAFFIC POSTS ARE USED THRUOUT

consume approximately 465 watts each; the Mazda "C" lamps consume 414 watts each, a saving of 51 watts per unit operated. Three pounds of coal per K.W.H. is the average for lighting plants thruout the United States using coal as fuel. A fair estimate of the saving effected by this one improvement is over 3,000 tons annually.

(2) *The labor charges are greatly reduced.*—Mazda "C" lamps are renewed from two to four times per year. The old arc lamps require trimming every eight days. To the latter must be added the time given to repairs and renewals of the intricate mechanism of the arc lamp.

The change from arc lamps to Mazda "C" lamps for the city of Chicago is a good example of what has been done in one American city. Wherever there is an arc lamp burning, there is a possibility of saving coal without lowering the quality of light. In most cases the service may be greatly improved because the Mazda "C" lamp adapts itself to modern reflectors and glass globes designed for the most efficient utilization of light.

Below is a table showing a comparison in operating cost between arc lamps commonly used for street lighting purposes and the more modern types of incandescent fixtures using Mazda "C" lamps:

CHICAGO TYPE SOL-LUX PENDANT USING 600-C. P. MAZDA "C" LAMP

With globe swinging down for cleaning and lamp renewal

Changing Clusters to Single Lights

The earliest forms of ornamental street lighting used standards equipped with clusters of five lamps each; 60-watt lamps are used in the pendant or side globes, and a 100-watt lamp in the top globe. When all lamps are burning, a system of 100 posts burning 4,000 hours per year would require 204 tons of coal of a fair grade. Compare this with a system of 100 single-lamp posts burning 200-watt Mazda "C" lamps which would give approximately the same degree of illumination on the street. This is a saving of 56,000 K.W.H. per year, and on the basis of three pounds coal per K.W.H. the saving represents 84 tons of coal. This is the amount of coal to be saved in the average city and town using cluster posts for ornamental street lighting. It would warm the homes of many families and help reduce the burden of our transportation system.

Average Coal Consumption of Arc Lamps and Mazda "C" Units

	*M.L.H. C.P	Watts per Lamp	Watts at Station	Lbs. Coal Per Year (4,000 hrs.)
6.6-amp. enclosed arc	230	425	460	5,520
7.5-amp. enclosed arc	270	490	532	6,384
4 -amp. magnetite	426	310	351	4,212
6.6-amp. magnetite	1,195	510	584	7,008
10-amp. flame arc	630	465	550	6,660
250-c.p. Mazda "C" 6.6 amp.	270	155	178	2,136
400-c.p. Mazda "C" 15 amp.	430	241	268	3,216
600-c.p. Mazda "C" 20 amp.	650	328	356	4,272
1,000-c.p. Mazda "C" 20 amp.	1,080	543	582	6,994
100-W 110-volt Mazda "C"	136	100	109	1.308
200-W 110-volt Mazda "C"	302	200	218	2,616
300-W 110-volt Mazda "C"	497	300	326	3,912
400-W 110-volt Mazda "C"	664	400	435	5,220
500-W 110-volt Mazda "C"	870	500	543	6,516
750-W 110-volt Mazda "C"	1,380	750	815	9,780
1,000-W 110-volt Mazda "C"	1,940	1,000	1,090	13,080

*Mean lower hemispherical candle-power

Several methods of changing cluster posts to single light styles may be used. The simplest one, and the most economical in first cost, is to replace the cross-arms with a suitable globe-holder, using the column of the post already installed and connecting the wires of the present underground circuit to a socket mounted in the new globe-holder. If the cross-arm is a separate piece, a globe-holder may be obtained that will fit directly on the end of the column. The globe and other detail parts of the new single-lamp unit should be selected with regard to lighting efficiency and the appearance of the complete standard, so that it is harmonious in design from the base of the present column to the top of the new lighting unit. The cluster lamp post shown on page 516 was first installed in Humboldt, Iowa, and has since been changed to the single-light post illustrated on the same page.

When considering a new installation, the single-light units are invariably given preference over the cluster post, not only because of their higher efficiency but also because of the more dignified and pleasing appearance of the street on which they are installed. Furthermore, visibility is increased by uni-directional light distribution, whereas the cluster lights are confusing. Therefore an added advantage is gained by substituting the single-light post for the cluster.

Make the street lights brighter and save coal to "keep the home fires burning" for the boys "over there."

The Government's Attitude Toward Building Operations

A Letter from W. G. McAdoo

The Secretary of the Treasury,
Washington, May 11, 1918.

Dear Senator Calder:

From the proceedings of the Senate of May 9, 1918, Congressional Record, page 6,755, you are quoted as saying:

"At no time in the history of New York have we needed more than at present new buildings for people to live in. We are prevented from having them to some extent because of the attitude of the Treasury Department in advising the banks and mortgage companies against loaning money upon mortgages on real estate. If the Treasury Department changed its attitude, the money could be obtained, new buildings would be encouraged, and we might then be able to help the housing problem we are facing here."

This statement is so wholly without foundation that I am amazed that you would make it. The Treasury Department has at no time taken any such attitude, nor has it ever advised banks or mortgage companies against loaning upon mortgages on real estate.

I have advised against the construction of unnecessary buildings during the period of the war, but I have laid emphasis upon unnecessary building. I have stated publicly, that

"Where it is a question of need—be it on account of sanitary conditions or because without such new construction other operations essential at this time for the welfare of the country would suffer—there is no doubt that the work should be undertaken. This applies equally to construction work in cities and towns and in farming districts."

In a letter to Mr. Gompers, dated March 15, 1918, in reply to a resolution adopted by the Building Trades Council of San Francisco, I said:

Building operations which are not required to protect the health or provide for the comfortable needs of our people or to supply facilities necessary for the proper conduct of business essential to the successful prosecution of the war should be postponed. I inclose a copy of that letter, also.

The attitude of the Treasury Department has been that capital which is needed during the period of the war should not be employed in the construction of unnecessary buildings at this time. But there has never been any suggestion that buildings actually needed for the health and protection of the civil population or for the conduct of essential business of the country should not be constructed during the period of the war.

I hope that you will correct your erroneous statement by the inclusion of this letter in the proceedings of the Senate.

Faithfully yours,

W. G. McAdoo.

Civic Work of Educational Institutions

Some Essentials in the Planning of School Buildings for Community Use*

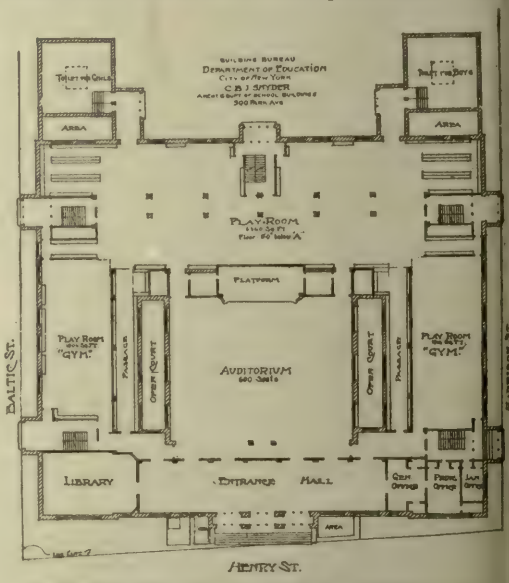
By William C. Bruce
Editor, American School Board Journal, Milwaukee, Wis.

THE use of school buildings for social and civic purposes by adults, while it is of extreme importance, must necessarily be secondary to the primary function of the school, which is the education of growing children of legal age. As a secondary purpose, however, the use of buildings for adults is such a vital factor in the development of constantly growing numbers of cities and villages that it cannot be trifled with or minimized by school boards even in these times of high costs and enforced war economy.

In the planning of schools, very little additional expense need be involved for making a schoolhouse a community center, if the architect will familiarize himself with present practice in the community and with the best practice thruout the country, and will conscientiously so plan every detail for school use that it may at some time be used for adults. If this be kept in mind, the schoolhouse can be made to meet its new opportunities at an expense not exceeding 5 per cent of the original cost of an ordinary building.

Types of Plans

Of the general types of schoolhouse plans, the school of the so-called open type adapts itself best to community use. The open plan makes it possible to place more easily assembly rooms and gymnasiums where they will be independent of the building as a whole, to provide separate entrances for libraries, game-rooms, etc., and to make independent provisions in the heating and ventilating plant. The one-story schools have similarly proved themselves adaptable, as is evidenced by the recent examples in California and in the North Central states. The group-plan high school building is perhaps the ideal solution of the community school for the small or medium-sized city, where the cost of ground does not make this arrangement prohibitive. In the large city the school planned for duplicate or platoon organization is well adapted for community use.



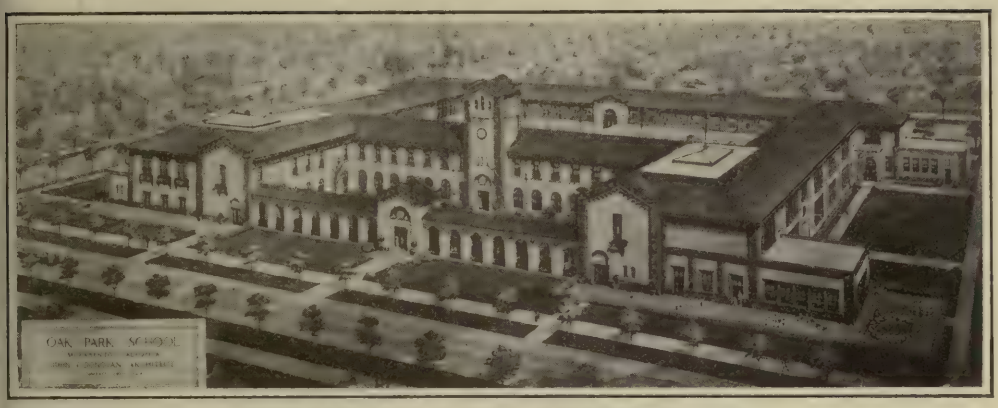
FIRST-FLOOR PLAN, PUBLIC SCHOOL 29, BROOKLYN, N. Y.

Illustrating the point of providing separate entrances and arranging the rooms close to the entrances and with few stairs and corridors to be traveled, in order to encourage particularly the attendance of foreign-born men and women

Important Points

A cardinal principle in the adaptation of schools to wider use is that of accessibility.

*From an article in a recent issue of *The Journal of The National Education Association.*



THE OAK PARK SCHOOL, SACRAMENTO, CAL.

A fully developed social center. In this building the assembly hall, the library and the kindergarten, permanently located in the front of the building, serve for social-center purposes

The closer the rooms to be used are to the entrances and the fewer the stairs and corridors to be traveled, the more valuable they will be. Directness and simplicity of plan make themselves felt here. Men and women, particularly of foreign birth, are likely to be sensitive and timid in entering schools, at least for the first time. Incidentally, the grouping aids economy in the use of the plant, in that it permits the shutting off of all parts not directly in use. The expedient of separate entrances to auditoriums and gymnasiums has proved its value.

Much friction between the community director and the day-school principal can be avoided if the architect gives due attention in his plan to the possible common use of rooms and to the introduction of means which will facilitate the routine of both departments. Lockers in special rooms or in the corridors obviate any misuse of children's books and supplies by adults. They will also serve to store the books and

AUDITORIUM IN A MILWAUKEE SCHOOL

The rear half is inclined at an angle of 20 degrees, and the front half is level. The room is equipped with fixed seating in the rear and movable chairs in the front. The latter are taken out for dances, drills and other social-center uses to which the room is put

materials of the evening teachers, play directors, shop instructors, etc.

Adapting Available Facilities

Of the three or four well-defined lines of community use of schools, the evening school is the oldest and most widespread. In recent years it has taken the form, not only of a continuation school for adults in the academic subjects and of a beginniners' school for foreigners, but also of a vocational school for men and women in the trades, and as a home-making school for women who are preparing for the duties of housewives. The strictly academic work of the evening school makes little demand for architectural adaptation. The average classroom, which measures 24 by 32 by 12 feet, is entirely satisfactory for the typical evening class of 20 to 25 members if it is seated with chair desks and is provided with adequate illumination.

Manual-training shops will be similarly valuable for evening use if they are equipped only with benches of proper height and with standard mechanics' tools. The domestic science room is perhaps more useful if it is arranged on the household-unit plan, that is, if each group of three or four students has a small standard range for cooking and a small table.

Primarily, an assembly hall, to be useful for evening use, must be located on the first floor and must be as directly accessible from the front of the building as is possible. The experience of Chicago and of many other cities shows that an assembly hall in the front of the building can be made an interesting architectural feature that will in no way interfere with the general uses of the school and will at the same time be doubly useful for outside activities. Under general conditions, in small buildings, the plan of placing the assembly room on the first floor directly back of the front entrance is quite satisfactory. The stage must be enlarged over the ordinary platform and must be accessible from adjoining classrooms or corridors for those who take part in pageants or theatricals. Two or more dressing-rooms are desirable.

If extreme economy is desired, the scheme developed by D. H. Perkins of making the stage serve as the kindergarten room or as an auxiliary recitation room is exceedingly valuable. Except in large buildings, where special rooms can be provided, the assembly room should have a flat floor that may be cleared for dances and similar activities where large numbers of people must have broad, open spaces. A fireproof booth for projecting motion pictures and for slides in connection with illustrated lectures greatly adds to the usefulness of the room. Local conditions may suggest a movable or permanent ticket-seller's booth and two wardrobes for receptions and dances.

The basement rooms for children's use can be similarly adapted to many evening uses if the architect makes them regular in shape, eliminates pillars, which interfere with free movement, and provides seats along the walls. Such basement rooms are more useful if storage space is provided for movable seating and small apparatus. They may be used readily for small political gatherings and for polling purposes. The latter use requires movable booths for the voters and some simple railings and tables. A small storeroom in the basement of the school can be arranged to hold all the special paraphernalia of the social-center director and of the election commissioners.

A great number of recreational opportunities for small groups with similar inclinations in the direction of music, games, debating, and miscellaneous club activities can be provided in classrooms if these are equipped with movable chair desks or tablet armchairs, and if storage room is provided for the necessary equipment. A small room but little larger than an ordinary cloakroom can readily be adapted for storing game tables, games, etc. If a folding partition is provided between two classrooms on the first floor of a building, the increased uses for larger groups will grow out of all proportion to the doubling of the space.

The greatest present need for further developing school architecture in the direction of making schoolhouses more valuable for wider use lies in closer coöperation of school authorities and architects. The men and women directly in charge of the social and community centers must have a voice in the councils of the school board and its executive officers. Their experiences and plans must become a part of the architect's working knowledge and must be evaluated in relation to the complete problem of plan and construction, sanitation, lighting, etc.

FORWARD STEPS
Reported to THE AMERICAN CITY by Municipal Officials & Department Heads

For this department the editors will welcome short articles from city, town and county officials and heads of departments, on subjects of interest and practical value to others engaged in similar work. Photographs, plans, or other illustrative material, should accompany the articles whenever available.

MAYORS

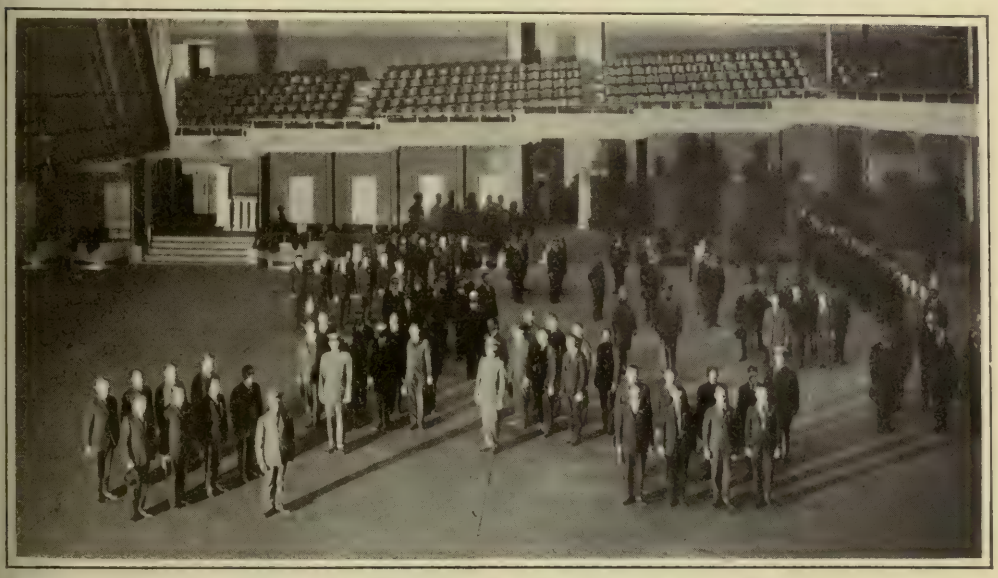
Denver Drills Drafted Men

DENVER, COLO.—Recently hundreds of young men, in squads of eight, have appeared upon the streets in residence districts in Denver, drilling with an enthusiasm and earnestness that speaks ill for the Kaiser. The squads represent citizens in Class A-1 in the selective draft, to whom the city is giving free instruction in military drill, rifle practice and conversational French. A post card bearing an invitation from the Mayor to take advantage of the city's offer was sent to every man in Class A-1, attendance being voluntary. Each man who attends is given a button to indicate his membership in the squad.

The response to the offer was instantaneous and enthusiastic. The men in Districts 7 and 9, who were first notified, have been drilling for a good while. About 200 attended the opening classes in the Auditorium, and open-air drills in the streets were soon inaugurated. Two evenings a week are given to these preparedness meetings. The Veterans of Foreign Wars and the Spanish-American War Veterans, instructed in the latest tactics by army drillmasters from Fort Logan, furnish the squad instructors.

Before maneuvers start, the registered men assemble at 7:30 o'clock and study conversational French under Prof. Henri Boulet, a competent teacher. Instruction in words and sentences most commonly used "over there" is being given first, so that the men will be able to carry on a conversation when they arrive in France.

Instruction in rifle practice is given by



DRAFTED MEN DRILLING IN THE DENVER AUDITORIUM

Captain A. M. Hardy, a noted rifle shot, who volunteered his services. A shooting gallery has been installed in a corridor of the Auditorium. The men are taught how to sight, load and handle a gun. These rudimentary lessons will be of immense assistance to the training camp instructors when they take the embryo soldiers in hand to give them intensive training.

The entire expense of this free instruction is borne by the city, which, having provided for the payment of premiums on a $1,000 war risk insurance policy for every Denver citizen engaged in the war, turned its attention to the men not yet drafted. Not only will this instruction help the Government, but it will make better soldiers of the men and give them a chance for rapid advancement. The most impressive thing brought out by this service is the eagerness with which the registered men have taken advantage of the opportunity.

W. F. R. MILLS,
Deputy Mayor.

CITY ENGINEERS

A Municipal Railway Tunnel to Aid City Development

San Francisco, Cal.—The inauguration of municipal electric railway transportation thru the Twin Peaks Tunnel, San Francisco, on February 3, 1918, marks the completion of one of the most important steps in the development of our city. As the city is divided by the Twin Peaks ridge of hills thru its center, its expansion has been limited by the lack of facilities for rapid transportation between the already crowded section to the east of the ridge and the west area beyond, which is highly suitable for modern residential tracts.

It had long been conceded that the only proper solution to this problem was the piercing of this ridge with a tunnel. When the writer became city engineer, a definite plan was evolved, and construction began in November, 1914. On July 14, 1917, the citizens of San Francisco fittingly celebrated the completion of the largest municipally owned tunnel in the world by marching thru it in a great procession.

To finance this great undertaking, two assessment districts were formed in accordance with the tunnel ordinance, which provides that the cost of such work be levied against property benefited. To levy equitable assessments was no little task, for 16,189 parcels of land were included in the two districts. The lands necessary for the construction of the subway section, in open cut, were purchased in fee simple, in furtherance of the city engineer's plans for the extension of Market Street, 90 feet wide, to connect with the scenic boulevard over the ridge, thus affording a route for vehicular traffic to the district, since the tunnel provides only railroad traffic.

The cost of the construction of the tunnel was $3,782,661.20. The contractor's bid of $3,372,000 and also the original estimate of cost upon which the assessments were figured, were based upon certain estimated required lengths of different types of tunnel construction. Altho borings made previous to the construction indicated a long stretch of hard material to be encountered, during the construction material of a soft character was disclosed to such an extent that it was necessary to increase the estimated quantity of the more costly heavily lined section, thereby reducing the estimated length of cheaper lining for hard material.

Immediately west of the easterly portal, a large underground station, known as Eureka Valley station, 300 feet by 56 feet, has been provided. This will ultimately be a transfer point, where surface passengers may transfer to subway cars, or where passengers from a future tunnel to connect with the Mission and Sunset districts may transfer to subway cars and vice versa. From the Eureka Valley station the tunnel runs to the intersection of Eighteenth and Hattie Streets, and thence in a straight line to the Laguna Honda station on the other side of the ridge, following a steady upward 3 per cent grade. From here the tunnel drops in a long sweeping curve on a 1.15 per cent grade to the westerly portal, which is situated near the center of several large residential tracts. The stations are constructed underground of structural steel and reinforced concrete, with attractive one-story superstructures.

Two types of reinforced concrete lining were used in the arched tunnel section—one being used to line the tunnel thru soft ma-

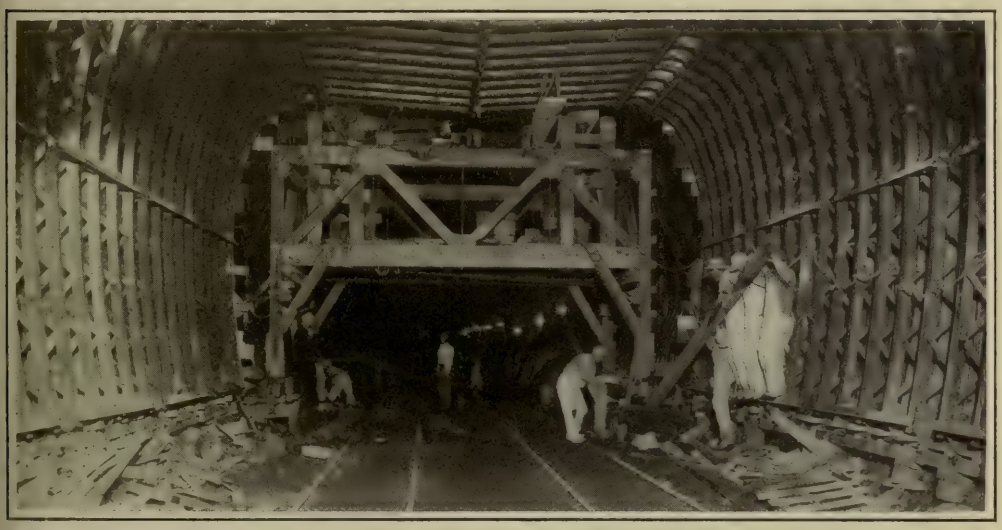
WEST PORTAL OF THE TWIN PEAKS TUNNEL, SAN FRANCISCO

terial, and the other thru hard material, as serpentine and sandstone. Both types are 25 feet wide in the clear and 20 feet high above rail grade, and were designed with a semi-circular arch of 12:6 feet radius on two side walls shaped to a 40-foot interior radius. The side walls in both sections have a minimum thickness of 2:9 feet, the arch thickness of the hard ground sections being 18 inches, and that of the soft ground section 22 inches. The latter section has a concrete invert lining 18 inches thick.

The net clearance above rail thruout the arch section is 15 feet, as a duct 7 feet high is formed between the upper portion of the tunnel arch and a suspended concrete slab ceiling. Fresh air for ventilation of the tunnel can be forced thru this duct and admitted into the tunnel proper thru openings at intervals in the slab. A reinforced concrete lined ventilating shaft, which rests on the tunnel lining, will be utilized as a flue thru which to draw fresh air from the surface by means of blowers situated on the slab at the bottom of the shaft. Near the easterly end of the arch section, a ventilating compartment for housing a second set of blowers was constructed above the flat top section, and connected with the arch section by a concrete duct.

At intervals of 50 feet, staggered on opposite sides, niches are provided in the tunnel walls, and in each of these is placed an electric light for illuminating the tunnel. The niches also serve as refuge places for track walkers, and some of them afford access to the fiber ducts set in the tunnel lining, which carry the power and lighting cables.

The total length of the tunnel, including



CONSTRUCTION WORK WITHIN THE TUNNEL

the easterly approach, is 11,913.5 feet. The following table gives the length of different sections and types of lining used:

	Feet
Segmental arch lining for soft material	5,899.0
Segmental arch lining for hard material	3,560.0
Special arch section for shaft substructure	20.0
Taper connection between arch and flat top sections	210.0
Flat top, double tube sections	1,365.0
Laguna Honda Station	300.0
Eureka Valley Station	300.0
Easterly portal and approach	259.0

As the selected grades did not allow of sufficient cover to tunnel, a section 2,000 feet in length at the easterly end was excavated in open cut. Over 95,000 cubic yards of dirt were taken out by two large steam shovels.

Where a portion of the cut followed the bed of a filled-in creek, heavy piling and timbers were required to hold up the sides, and 30,000 cubic yards of material was excavated by hand labor with picks and shovels. In this huge cut thousands of feet of timber was used in form work, tons of reinforcing steel placed, and thousands of yards of concrete poured to construct the station, the easterly portal and the double compartment section.

The excavation in the tunnel was carried on mainly from the open cut sections at the easterly and westerly portions of the work. Short stretches were also driven in either direction from the ventilating shaft. In driving from the shaft, water-bearing sand was struck, and presented great difficulties and danger in the work, as a flow of 300,000 gallons of water per day was developed from the bottom of the shaft. This made it necessary to drain the material by driving ahead of the main tunnel excavation a smaller tunnel (known as a drift) about 7 feet high and 4 feet 6 inches wide. In the main tunnel the method known as the wall plate drift method was adopted. Much of the timber used in this portion of the work was material that had been salvaged from the Panama-Pacific Exposition. From 1,000 to 1.2000 feet B. M. of timber was used per foot of tunnel excavation.

The concrete in open cut work was mixed in standard rotary mixers and placed by gravity thru chutes directly into the forms. For the placing of the concrete lining of the tunneled section complete pneumatic mixing and conveying plants were installed near each entrance to the tunnel. Fleets of motor trucks were constantly delivering cement, sand and rock to the bunkers maintained on the surface above these plants. From these bunkers the material flowed thru measuring boxes to the receiving hopper, whence by means of compressed air it shot thru an 8-inch pipe to the forms, on its way being churned and mixed with water to the proper consistency. In this manner, a few seconds after the different ingredients had left their separate storage bunkers, concrete was placed direct into the forms, a maximum of 4,000 feet from the receiving hopper.

Huge collapsible steel forms in 10-foot sections were used, being moved forward as rapidly as the concrete hardened sufficiently. The use of these steel forms and the pneumatic concrete plant kept the tunnel tracks clear for the passing of the trains of cars which carried the excavated material to the surface. The work was pushed forward by day and night without intermission, and on April 5, 1917, the cry of "holed thru" greeted the connecting up of the excavations from the two ends. Three months later this colossal achievement was given to the public, opening up 10,000 acres to the future growth of the city.

M. M. O'SHAUGHNESSY,
City Engineer.

CITY CLERKS

Dayton's Community Country Club

Dayton, Ohio.—A very unusual municipal activity has been made possible for the city of Dayton and its people, not only for the present but for all time, by the generosity of John H. Patterson, president of the National Cash Register Company, of this city, who recently gave the city a general warranty deed for a tract of 294 acres, admirably adapted and fully developed for country club purposes. Accompanying the deed was his personal check for $10,000 to pay the cost of operating the club for the current year, and he will give a like amount for each of the next two years, in order that the city may have ample opportunity to master the details of financing this additional activity, and that the gift may not in the meantime be a public charge. His company also gave all the equipment, fur-

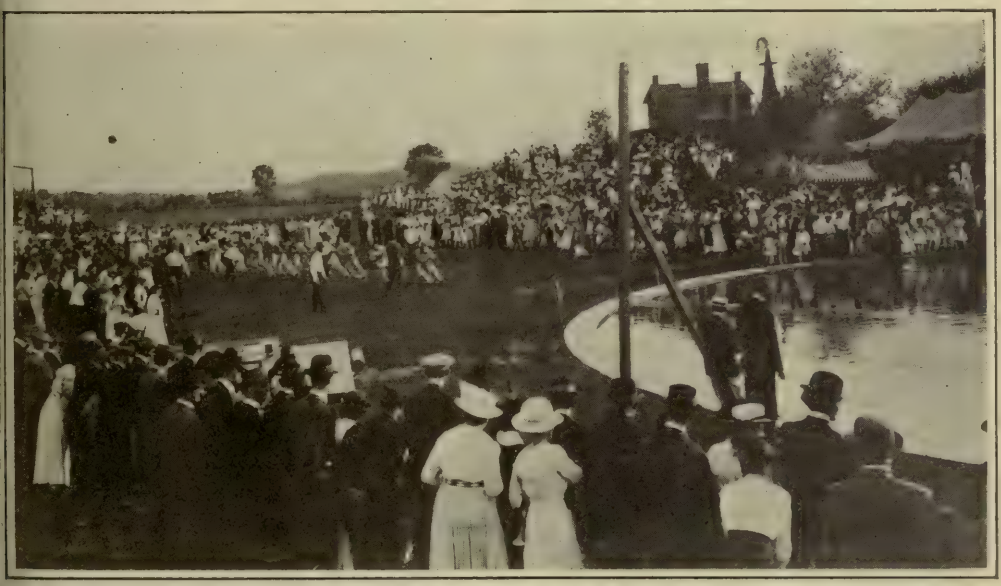
ONE OF THE CAMPS AT THE DAYTON COMMUNITY COUNTRY CLUB

nishings, tools, etc., which it had acquired at great expense, so that the club, which it had used as a country club for its employes for several years, might be complete in every detail.

The deed specifies that

"The premises shall be forever used and maintained as and for a public park for the enjoyment of all the people subject to the laws and ordinances of the state of Ohio and the city of Dayton and such reasonable rules as said city may in its discretion prescribe; it being the intent herein that while said premises shall be forever free to public use and enjoyment, nevertheless the grantor recognizes that it may be necessary for said city to impose charges pertaining to special community and recreational work, but such imposts shall be purely nominal and, so far as possible, temporary, and in no wise interfere with the free use and enjoyment by the public of said premises as and for a public park.

It is further stipulated that the city shall provide at least $5,000 per year for maintenance and operation.



ON FIELD DAY, THE LOSERS IN THE TUG-OF-WAR CONTEST SHOWN HERE WERE DRAGGED THRU THE WADING-POOL BY THE VICTORS

Entering the club from the city by auto, bridle path or on foot, one will most likely take one of the ways thru the beautiful hills and dales in a portion of Mr. Patterson's estate open to the public, and will thus come thru the wooded hills which skirt the club on a portion of the north and east sides. Spread out before him he will find a scene of unusual beauty—rolling hills, grassy meadows, with the club buildings in the distance nestled among spreading trees and half hidden behind great clumps and waving outlines of shrubbery. First, there are the two polo fields, and here and there a green or some other sign familiar to the golf enthusiast; nearer the buildings are the three baseball diamonds; and the fourteen tennis courts enclosed in netting and equipped with lights for night playing are not to be overlooked.

The buildings consist of the manager's residence, to which are attached his office and a commodious and beautifully furnished reading room, also a sun porch, both for the use of the public; the women's club, consisting of a large club room furnished with plenty of easy chairs, a player-piano, a victrola and games, a nursery and showers, while upstairs are lockers and sleeping rooms equipped with twenty-five beds; the men's club, consisting of a lounging-room with comfortable chairs, pool tables, lockers and showers and upstairs sleeping rooms containing forty-eight beds; the dancing pavilion, checking stand, restaurant and refreshment stands and a small private dining-room complete the rectangle of buildings, enclosing a beautiful picnic grove, where meals are served in the open and where large picnic parties spend summer afternoons. Right in the midst of the grove is found all the apparatus of a fully equipped playground—sand piles, slides, teeters and swings galore, and near-by a fine, big concrete wading pool, all for the delight of the children and located for the convenience of the mothers watching over them. But we must not omit reference to the motion picture booth for open-air "movies," and also to the bake-oven, open fireplace and barbecue grate, all of which contribute to the completeness of the grounds for the entertainment of picnic parties of any size.

While the club grounds are for the use of the public generally, still, for the special privileges, such as golf, tennis, dancing, and the use of the men's or women's clubs, nominal charges are made; the fee for general membership, including all privileges, is $5 per year for men and $2.50 for women. Special golf or tennis memberships are also offered. The general membership admits the bearer to all dances given by the club and provides special rates for lodging, as well as unlimited golf and tennis privileges.

The management of the club is in the hands of the City Welfare Department. The club is open at all times thruout the season. Dances are given regularly on certain nights of the week. Special events are being planned to increase interest in the club and to encourage people to utilize the exceptional advantages which it offers. Various field day contests are being arranged, also a pageant; the games of the municipal baseball league are played on the grounds, and organizations are encouraged to hold their picnics there. A nominal charge is made for exclusive use of the grounds upon any day or evening. Refreshments are sold at all times, and meals are prepared upon reservation.

The club is prepared to furnish golf, tennis and baseball outfits, which are let at a nominal rental, and members are encouraged to have their guests use the privileges of the club, for which a small charge is made. Even bathing suits are furnished to the children who play in the wading pool.

For the small picnic party the five camps are ideal. Each one consists of a rustic structure at a point of vantage, usually with southerly exposure, on the edge of the woods overlooking the rest of the club grounds. It serves as a shelter from the weather and as a place to keep the table and kitchen outfits which are provided for each camp. There is always an open fireplace, and a supply of wood is kept handy together with fresh water. These camps are exceedingly popular, and there is seldom a day when all are not in use. Reservations are made with the City Welfare Department, and the small fee of one dollar is charged. It is a rule, seldom broken, that the users shall leave the camp in good order, and most of them leave all utensils clean and in place for the next party.

This gift has increased the actual valu

of the city's park property by a million dollars; the land alone is conservatively valued at $3,000 per acre, and such improvements as the beautiful drives, the landscaping, golf links, tennis courts, buildings and equipment at present value, easily bring the total figure up past the million mark.

Mr. Patterson has given Dayton a great opportunity to bring the blessings of sunshine and fresh air and the benefits of wholesome recreation to all of her people.

JOHN B. HARSHMAN,
Clerk of the Commission.

A Chart Record of Street Department Work

COLORADO SPRINGS, COLO.—On January 1, 1918, the new Commissioner of Public Works and Property in Colorado Springs, Edgar Payton, changed the order of things by providing for four districts in the Street Department, supervised by four division foremen, instead of retaining the former method of having all work performed under the immediate direction of the Superintendent of Streets.

The accompanying chart shows the benefits to be derived by thus dividing the

STREET DEPARTMENT
MONTH OF ... JANUARY ...

Classification of Work	No. Blocks Graveled	No. Blocks Dressed	No. Wagon Loads Gravel	No. Wagon Loads Dirt	No. Truck Loads Gravel	No. Truck Loads Dirt	Cu. Yds. Gravel	Cu. Yds. Dirt	No. Blocks Sprinkled	No. Gallons Thousands	No. Men Worked	No. City Teams	No. Hired Teams	No. Single Horses	Board Ft. Lumber	Miscellaneous	No. Loads	$		$		$	
SWEEPING DISTRICT																							
Sweeping Sts. & Alleys				68			102			104½			22							360	13		
Removing Snow & Ice										91	9		5			399				268	67		
Horse Maintenance										15¼										39	35		
Street Car Sprinkler									423											668	15		
Labor Rendered by North, South and West Districts																				72	01	740	16
Total Expenditure for District				68			102		423	210¾	9		27			399						740	16
NORTH DISTRICT																							
Dressing Sts. & Alleys		18								11⅞	10⅛									41	45		
Graveling Sts. & Alleys	8		838½		12		1317¼			138⅞	41½									433	84		
Repairing Ditch Boxes										4⅛			3⅝	825						12	79		
Cleaning Sidewalks										3										9	50		
Removing Snow & Ice										13										41	51		
Patching Streets & Alley			28		3		57			6½	8									19	29		
Cleaning Ditches				189				283½		36½	5									115	25		
Sprinkling Sts. & Alleys									163	71.25	6¼	16¼								18	75		
Labor Rendered by South District																				126	39		
Credit and Charge Sweeping District																		41	51	818	77		
Total Expenditure for District	8	18	865½	189	15		1374½	283½	163	71.25	220⅝	87⅛	3⅝	825								777	26
SOUTH DISTRICT																							
Cleaning Ditches						6		30			2									6	25		
Graveling Sts. and Alley			18⅓		12		87½				59½	40½								185	68		
Cleaning Sidewalks											2⅝									8	00		
Removing Snow and Ice											8	6								24	00		
Patching Sts. & Alleys			28		3		57				6½	5								19	30		
Sprinkling Sts. & Alleys									162	71.25	6½	6½								18	75		
Dressing Sts. & Alleys		13									8⅞	7								32	09		
Repairs to Ditch Boxes											6			2⅔	824					18	80		
Credit and Charge Sweeping District																		24	00	312	87		
Credit and Charge North District																		126	39	150	39	162	48
Total Expenditure for District		13	46⅔		15	6	144½	30	162	71.25	99¾	65		2⅓	824							162	48
WEST DISTRICT																							
Graveling Sts. & Alleys	7		117⅔		30		325½				76⅛	41½	19							264	80		
Patching Sts. & Alleys			38				57				7½	2	3							23	54		
Removing Snow and Ice											10½	2½	½			20				36	75		
Sweeping Sts. & Alleys											2	2								6	50		
Repairs to Ditch Boxes											4			⅔	824					12	54		
Cleaning Sidewalks											2⅝									8	00		
Dressing Sts. & Alleys		13									8⅞	7	8							32	08		
Ditch Cleaning				6				9			1½	¾	½							5	75		
Miscellaneous											7	1								21	37		
Credit and Charge Sweeping District																		6	50	411	33	404	83
Total Expenditure for District	7	13	155⅔	6	30		382½	9			120½	56½	25	⅔	824		20					404	83
GRAND TOTALS	15	44	1068	263	60	6	1901½	424½	325	565.5	650¾	317⅝	25	34	2473		441					2084	73

ONE MONTH'S RECORD OF STREET DEPARTMENT WORK IN COLORADO SPRINGS, COLO.

work, for it is apparent from even a glance at the chart that it must be a stimulation to all concerned—both foremen and men—to increased activity and zeal. Each one, in a friendly way, tries to make as good a showing as possible, both in cost and in labor performed, as well as in the appearance of his particular district as compared with the others. A copy of the chart for the preceding month is placed in the hands of the foreman of each division in order that he may know just what the other divisions are doing. The chart also shows the itemized and the complete cost of the work done by each district and how many men were engaged in doing the work.

Furthermore, the citizens can at any time have access to the chart and readily find out whether their particular district is getting its fair share of the appropriation which they helped to pay for, and whether their part of the town is being neglected in the street department activities.

This city has always kept an itemized expense account in its Department of Public Works and Property, but I think this is a more concise manner of showing the citizens and taxpayers just how and where their money is being spent for street work. While it is not by any means a new plan, it may be of interest as showing the way in which one city is developing it. Its adoption has certainly been a forward step for Colorado Springs.

CHARLES CHAPMAN,
City Clerk.

EDUCATION DEPARTMENTS

The Planting of Public School Grounds

St. Louis, Mo.—It is generally known that St. Louis has some of the most modern school buildings in the country and was one of the first cities to provide congenial surroundings for them. The improvement of the grounds at the newer school buildings had its beginning about nineteen years ago and was prompted in a measure by a desire to show up the buildings to better advantage. The appearance of the building, however, was not the only motive; the Board thought that maintaining well-kept grounds around the buildings would help to create a desire for better home surroundings and at the same time would teach the children to respect public as well as private property. To stimulate civic pride was another purpose of the Board.

From the modest beginning, the work increased to such an extent that in 1908 the Board found it necessary to establish a Landscape Division so that proper attention could be given the older plantation as well as the new work. We now have forty-five modern school buildings, each one with grounds covering an ordinary city block. Besides these large places, there are about

FRONT VIEW OF THE ROSE FANNING SCHOOL, ST. LOUIS

GROUNDS OF THE ASHLAND SCHOOL

forty with smaller planted areas.

On completion of a new building, the grounds are turned over to the Landscape Division for final grading and for planting. The rough grading is usually included in the general contract, which also calls for the surfacing of the entire area with six inches of good loamy earth.

Some people may criticise the ever-occurring terraces in front of the buildings, so that a few words in their defense will be timely. In the first place, school buildings of this type show up to better advantage on a higher elevation than on the street grade. Economy is also a factor in terracing the grounds. Where the school site is above grade, the placing of the building on a higher elevation saves considerable expensive grading; and where the grade of the lot is normal, the buildings are usually planned so as to make use of the basement excavation for building up the terraces.

The planting treatment of terraced grounds such as ours is not so simple as it

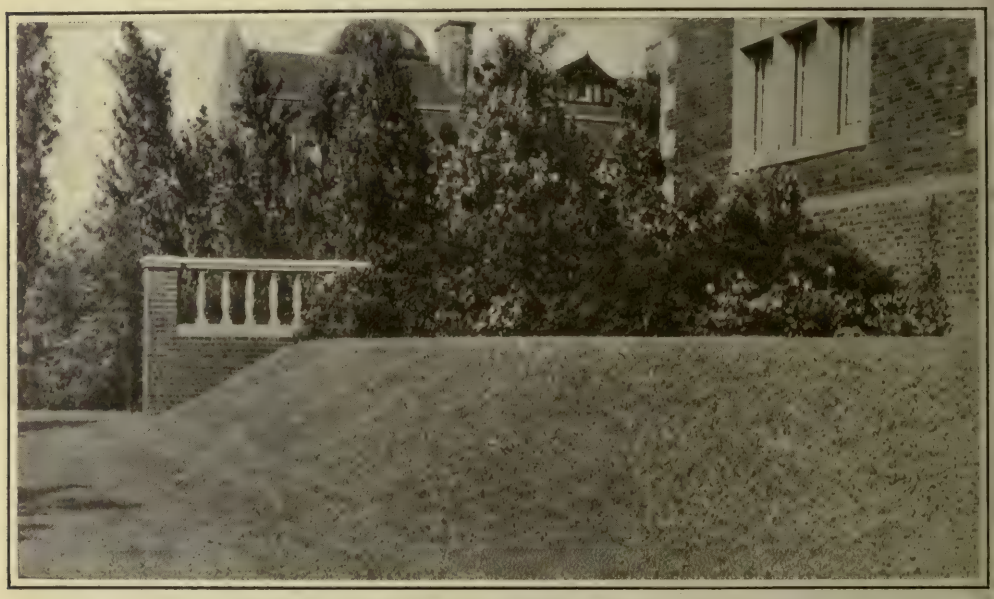
MAIN ENTRANCE OF THE WALNUT PARK SCHOOL

may seem. Shrubbery groups or any other material planted on a straight terrace seems to be out of place, and yet one feels that something should be there to break the bareness of the place. We have, of course, the entrances to work on, and the ends of the terraces where they adjoin retaining walls or buildings, but all such planting must of necessity be symmetrical or balanced, and no naturalistic effect can be accomplished such as could be produced on informally laid-out grounds.

In selecting material for shrubbery groups, my aim is to plant as varied a collection as possible according to the size of the grounds. This is done with the object of giving the teachers and pupils an opportunity to get acquainted with the shrubbery usually planted in and around St. Louis. Several shrubs of one kind are usually massed together, if the size of the group permits. An ample margin in front of the shrubbery is reserved for the planting of various flowering and foliage plants, in preference to formal beds.

California privets are used extensively for lining the walks and to mark the property line, so that up to the present time we have about 24,000 lineal feet of hedging. With the possible exception of Berberis Thunbergi, no other material seems to be better adapted for hedging than the California privet, which gives the desired results in a comparatively short time with equal success in any part of the city. Berberis will not thrive in the down-town districts, and even in favorable locations it is slow of growth. Higher prices, no doubt, have also prevented the more extensive planting of Berberis for hedges.

Shade trees are usually planted along the sidewalk inside the property line, in some cases bordering the entire place. In former years, soft maples were planted almost exclusively with Lombardy poplars, and in some cases Grecian or even Carolina poplars placed alternately for quick effect. This, however, I consider bad practice for more than one reason. Very often the poplars crowd the permanent trees before they can be cut out, and when they are removed there is sure to be a vigorous protest by the neighborhood, which does not understand the purpose of it. In recent years, we have planted mostly American and European sycamores.



A CORNER AT THE SOLDAN HIGH SCHOOL, ST. LOUIS

The playgrounds at all of the public schools consist of brick-paved areas, large enough to provide a specified number of square feet for each pupil. Nearly all of the playgrounds are surrounded with strips of ground from eight to twelve feet wide

reserved for the planting of trees and shrubbery. While this idea is a good one and the finished plantation would add much to the appearance of the place, the experience we have had with these planted strips is anything but encouraging. In time the shrubbery is destroyed completely or presents a very dilapidated appearance, and the trees lead a hard struggle for existence. Contrary to expectation, however, trees which have been planted in the brick-paved playgrounds in a number of places have made exceptionally good growth.

We grow all our own plants for the decoration of the grounds and also the necessary supply of potted plants for the planting of about nine hundred window boxes in fall for inside use.

HUGO M. SCHAFF,
Superintendent of School Grounds

DOUGLAS PARK PLAYGROUND, IN THE WEST PARK SYSTEM OF CHICAGO

PARK DEPARTMENTS

Bonuses to City Park Employes

CHICAGO, ILL.—The West Chicago Park Commissioners recently adopted a course of action which I believe to be a most novel one for a municipality. It resulted, in effect, in the declaration of bonuses to all employes of medium salary.

The constantly mounting costs of life's necessities have brought about earnest and well-meaning requests from all employes for more compensation. The Federal and State Governments, as well as municipalities in general, are increasing the pay of their employes. In the case of the city of Chicago, it became necessary to borrow two million dollars from a group of private citizens in order to permit increasing the wages of city employes.

Our Commissioners were quite convinced that conditions called for such increases for our employes. At the same time, however, they realized that a flat increase in pay would preclude the possibility of reducing the salaries at any future time when economic conditions had returned to a normal basis that would warrant such action. With private employers the practice has become quite general to grant a bonus periodically in order to meet the abnormal living conditions. The Park Commissioners in their endeavor to operate the system upon the same business basis that should apply to any private concern, felt that it would be only consistent to follow the practice of declaring a bonus. They have therefore ordered the payment of extra compensation to all employes, $150 per month or less, for the quarterly period ending March 31, 1918.

The following notice has been issued by the President of the Board to the employes,

and describes the method of distribution in detail:

To Officers and Employes:

The Board of West Chicago Park Commissioners, in special meeting to-day, ordered that extra compensation be allowed to the moderately paid employes, in order to relieve in some measure the conditions which have been brought about by the high cost of living. This extra compensation will be based upon the total earnings of the individuals affected for the quarterly period ending March 31, 1918. The amounts of extra compensation will be as follows:

Common Laborers who are paid on the hourly or monthly basis will receive 10 per cent of their total quarterly earnings.

Monthly employes whose rate is $110 per month or less will be paid 10 per cent of their total quarterly earnings.

Monthly employes whose rate is more than $110 per month, but not more than $125 per month, will be paid 8 per cent of their total quarterly earnings.

Monthly employes whose rate is more than $125 per month, but not more than $150 per month, will be paid 6 per cent of their total quarterly earnings.

Monthly employes whose rate is more than $150 per month, special laborers and hourly employes will not receive extra compensation.

Where an employe has not served for the entire quarterly period, his extra compensation will be calculated on the actual amount of pay he received for services rendered during that time. Employes who resigned or were discharged previous to the expiration of the period will not receive compensation.

The Commissioners have ordered the payment of this extra compensation to help meet the trying financial conditions which they realize must be faced by the moderately paid employes.

In order to make it possible to continue the allowance of this extra compensation for future quarterly periods, it will be necessary to reduce the ordinary operating expenses in proportion. It is therefore expected that every employe will do his utmost to conserve the resources of the Park System, and to make his service more effective, and thus reduce the operating expenses.

I am not aware that any other public body has taken this step, and it seems likely, therefore, that it will be of interest to the readers of The American City.

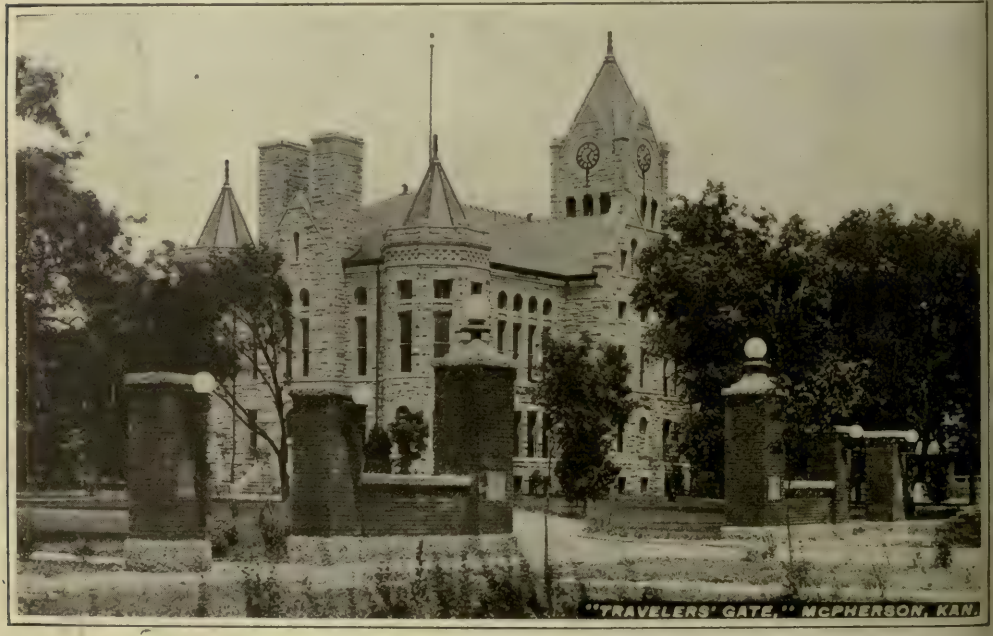
JOHN F. SMULSKI,
President, West Chicago Park Commissioners.

The Parks of a Kansas Town

McPherson, Kans.—McPherson is justly proud of her parks. This little city of the Kansas plains has demonstrated what is possible in this kind of civic improvement if determination and good sense are used.

Four years ago the plan of having a city park originated in the heads of some of the active citizens, and they "got busy." The Court House occupied the center of a square block. It was decided to use the block immediately behind this building, and by closing the cross street between these two squares to have one large plot of ground with the county building the only one on it. Satisfactory arrangements in the matter of coöperation from the city and county with the citizens was secured, and arrangements were soon completed. A professional landscape gardener was secured, and the work was started. The funds for the carrying on of the work were raised mostly by subscription.

Several trees which were on the ground when the work was started were used—some being transplanted—and many new



TRAVELERS' GATE AND COURT HOUSE IN CENTRAL PARK, McPHERSON, KANS.

LOOKING ACROSS CENTRAL PARK

ones were added. A beautiful lawn with a pretty path plan was laid out. A large lagoon with a flowered island and a bridge leading to it enhanced the beauty. Large flower beds were tastefully arranged. One of the most interesting features of this park is the statue of General McPherson, a life-sized bronze, unveiled last Fourth of July.

Shortly after the transformation of this barren plot of ground was undertaken, another park three blocks away was laid out. While this latter park is only half the size of the first, the same care and good sense that were used in the construction of the first

FOUNTAIN IN McPHERSON PARK

park made the younger plot a place of beauty.

Both parks have adequate lighting. Scattered along the paths are standards similar to those used in white way work. The gates are surmounted with large frosted domes. All wiring is carried underground.

C. E. OELRICH.

PUBLIC SAFETY DEPARTMENTS

A City Chaplain

Denver, Colo.—For several years past a quiet man in clerical garb has called at the Mayor's office in Denver at intervals with the request that a pardon be granted some inmate of the city or county jails.

Mayor Robert W. Speer became interested in these petitions, because he found, upon investigation, that they always contained merit. He reached the conclusion that there is a need for a public official to handle cases of those unfortunates who are the victims of untoward circumstances, rather than of criminal tendencies.

From this beginning came the recommendation to the City Council, which was promptly acted upon, that an ordinance be passed, creating a city chaplaincy, with a salary of $1,200 a year. The duty of this official is to visit jails, hospitals, police courts and public institutions, where the down-and-out members of society are found, to help the deserving regain self-respect, freedom and a job, so that unfortunate individuals may be saved from criminal careers, and society relieved of the burden of their support.

It is a well-known fact that many police officers, thru their constant contact with the criminal classes, become inclined to look with cynicism upon cases that really offer a chance for social redemption. The public defender's office does not quite meet the situation, for it is subject to political influence, jealousy and antagonism. A tactful city chaplain may gain the confidence of the accused where a police officer would be regarded with distrust.

Mayor Speer appointed Jim Goodheart, head of the Sunshine Mission in Denver, to the new office. He was the man who had attracted the Mayor's attention to the need, and offered to take the position without pay. As one who has drained the dregs of life and raised himself thru his own efforts to a position of respect and honor in the community, as well as for his knowledge of human nature and his sane judgments, he is peculiarly fitted for the work.

Chaplain Goodheart had barely started upon his work when he was called to France by the Government. The city has granted him a six-months' leave of absence for war work, and an assistant will occupy his post while gone.

One or two instances of cases handled by the chaplain will illustrate the nature of the work. Chaplain Goodheart's first case was that of a young Jewish lad of 17, arrested for vagrancy one-and-a-half-hours after he had reached Denver. He received a thirty-day sentence in police court and was unable to notify his people because he lacked even a postage stamp. His pardon was granted, and a position was found for him.

A more affecting case was that of a young man, unable to do hard work because of tuberculosis, whose wife was about to become a mother. Altho a brother was helping as much as possible, the young man became desperate and stole an automobile to secure medical attention for his wife. He was arrested and bound over to the criminal court on a felony charge. His wife gave birth to the child while he was in jail, the shock of his arrest bringing her close to death's door. Chaplain Goodheart induced the motor club to dismiss the charges, the brother paid the police court costs, and a position was secured for the victim which he could fill. His wife recovered, and he is now leading an exemplary life.

DEWEY C. BAILEY,
Manager of Safety.

Editorial Note.—Since the foregoing item was prepared, word has been received of the death of Mayor Robert W. Speer, on May 14.

WATER DEPARTMENTS

A Water-Supply Which Furnishes Power to Pump Itself

Bellefonte, Pa.—The borough of Bellefonte is the county seat of Center County, Pa., and is a flourishing industrial and agri-

Courtesy of Westinghouse Department of Publicity

THE BOUNTIFUL SPRING THAT SUPPLIES THE BOROUGH OF BELLEFONTE, PA.

cultural center, having a population of approximately 5,000. Its water-supply is of particular interest because of the fact that the source is a bountiful spring of clear, pure water right in the heart of town.

In order to utilize this ample supply of fresh, unadulterated water, a retaining wall has been built, enclosing a space of 60 x 80 feet with a depth of 8 feet, as shown in the illustration. A concrete walk around the spring admits of convenient inspection. Regardless of storms and the resulting muddy condition of the two creeks which flow thru the town, the spring water is always clear. On account of its attractive appearance, the spring is a point of interest for both town people and tourists. It has a capacity of 420,000 gallons an hour. The supply never varies in quantity, no matter how wet or how dry the season is, and the temperature variation is only about two degrees.

The water is distributed from the spring to the mains by means of three pumps operating in connection with a reservoir. Smallest in capacity, and therefore of least importance, but decidedly the most novel, is a water-turbine pump operated at a 7-foot head from the spring itself. In other words, the spring furnishes power to pump its own water. This pump, which has a normal capacity of about 172,000 gallons a day, forces the water directly thru a 6-inch line to the reservoir.

In order to take advantage of an available head of water in the Phoenix Mill nearby, a water-turbine-driven pump with a capacity of 1,400,000 gallons per day is installed therein. The cost of operation of this unit is only $4 per million gallons. In addition, there is installed in the pump house at the lake, as shown in the accompanying photograph, an electric motor-driven centrifugal pump with a capacity of 1,320,000 gallons per day. Current for the operation of this outfit is supplied by the State Centre Electric Company at a rate of $18 per million gallons. This company has charge of all the pumping equipment of the water-works system.

The two units last mentioned pump the water directly into the mains, the excess going to the reservoir thru a 12-inch main, which also serves as an outlet for the

reservoir when it is called on to supply water to the system.

The reservoir is located on a hill immediately above the pumping station, affording a head of 196 feet against which the pumps operate. It has a capacity of approximately 300,000 gallons, or about 12 hours' supply under present operating conditions. A steam reserve unit is maintained in the pump house for use in case of failure of, or accident to, the electric- or water-driven units. This consists of a steam boiler and a compound, reciprocating, duplex pump with a capacity of 1,500,000 gallons per 24-hour day.

In addition to a suction pipe for each of the above-mentioned pumps, there is another line from the spring to the works of the Pennsylvania Match Company. In case of emergency or trouble at the pumping station, this equipment can be used to feed back into the city mains until the difficulty is remedied.

The borough lays the main to the curb, and the consumer is responsible from this point in to the building. Water is supplied at a flat rate to residences and stores, but services to the railroad and consumers using boilers are supplied on a meter basis according to the following rates: 5 cents per 1,000 gallons, for the first 1,000,000 gallons; 3 cents per 1,000 gallons for all over this amount. Consumers living outside the boro limits are also supplied on a meter basis and at the following rates: 20 cents per 1,000 gallons for the first million gallons, with a minimum of $3 per quarter. All meters are read quarterly. Flat rates are based on an assessment of the operating expenses and are adjusted each year accordingly.

Fire protection is afforded thru about 70 hydrants distributed thruout the boro, at which a pressure of from 20 to 100 pounds is maintained, according to the elevation. Two fire companies, each with an engine, are provided by the municipal government.

Analyses show the water to be unusually pure and free from any form of contamination. This fact is also borne out by the excellent health and freedom from epidemics with which the people of Bellefonte have been favored.

J. D. SEIBERT,
Acting Superintendent, Water Works.

PUBLIC WORKS DEPARTMENTS

The First Municipal Motor Bus Line for Street Service

San Francisco, Cal.—This city recently inaugurated (on January 15) the first municipal bus street service in the United States. The opening of the line was made the occasion for a big celebration. City officials, accompanied by a band, paraded the city streets and made special trips in the busses thru the districts which the busses are intended to serve as an auxiliary to the Municipal Street Railway system.

The four bus routes now in operation range in length from one and one-half to two miles, and all pass thru sparsely settled, outlying districts; none of them comes within three or four miles of the business part of the city. Five busses especially built by The White Company to make one-man operation possible are in use, and five more are being built for this purpose. Two rented machines are also in service. The busses are in charge of conductors of the Municipal Railway, who act as drivers and also collect the fares. Each bus has a carrying capacity of forty passengers. There is a long aisle in the center, with seats for two passengers on either side, and a wide seat in the rear occupying the full width of the body. Sanitary straps hang from the ceiling, and electric lights allow persons to read with comfort in any part of the bus. A step-light is furnished. Passangers pay as they enter. Electric lighted route signals on the roof designate the terminal points. Regulation street car gongs, hand-operated, are mounted on the roof, and electric push button stop signals are placed opposite the seats. The busses are painted dark gray, to conform with the color of the municipal electric cars.

The result of the bus operation for the month of March is shown in the following table:

Bus Operation—March, 1918

Revenue

Total cash receipts on busses	2,783.80
Total credits received from transfers, school tickets and Quartermaster tickets from connecting street cars	1,223.55
Total revenue	$4,007.35

Cost		
Total operating expense, exclusive of tires	$4,317.21	
Estimated tire expense, 32,721 miles at 5 cents per mile	1,636.05	
Total operating cost		$5,953.26
Operating loss		$1,945.91
Reserves		
Depreciation (18 per cent of gross revenue	$ 501.08	
Compensation insurance (based on wages paid bus drivers)	40.74	
Total reserves		$ 541.82
Total loss		$2,487.73
Average net loss per day		80.25
Cash receipts per bus mile		.085
Operating expense per bus mile		.182

As we have not operated these busses long enough to get any data as to tire expense, we have relied on guarantees on tires and the experience gained by one or two private enterprises of a like nature for our five-cents-per-mile estimate, and it would appear that this estimate is ample. It was not expected that the busses would make any money; in fact, we are doing a little better with them than we really expected to do. We do not charge passengers any extra fare for the bus privilege, as they are given a transfer to the connecting street cars on the one fare.

The lines were instituted in these districts as a preliminary to building new car lines, which it is almost impossible to do at the present time, on account of the excessive cost of material and the long delay in getting it. In other words, such lines may be used to some advantage, but would hardly make any return on the money at the ordinary street-car fare.

F. BOEKEN,
Superintendent, Municipal Railway.

FIRE DEPARTMENTS

Investigating Fires Before the Evidence is Destroyed

CHICAGO, ILL.—It is an established fact that it is very difficult to obtain convictions in arson and kindred crimes, because in many cases the direct evidence is destroyed by the fire, and the prosecution must depend largely on circumstantial evidence, except in a few rare cases where confessions are obtained.

It was formerly the rule in the Chicago Fire Department that all fires originating from a suspicious cause be immediately reported by the Battalion Chiefs to the Fire Attorney and the State Fire Marshal, who

MUNICIPAL BUS IN OPERATION IN SAN FRANCISCO

would send their investigators to the scene of the fire. Under this system there would, however, be a considerable lapse of time, during which evidence might be destroyed or covered up. In order to avoid this delay, the Bureau of Fire Prevention and Public Safety decided to experiment on a new system, for which six inspectors were detailed.

The men are distributed at the various Squad Companies, and work in two shifts, one day and one night. They respond with the Squad Companies to all alarms. They are not required to perform any fire duties, and devote their entire time to investigations.

Arriving at a fire, their first duty is to determine the cause, and make such other observations as may be necessary.* Should the fire be of suspicious origin, the inspectors collect all available evidence and question the various persons interested, thus getting their statements before they have the opportunity to "frame" a plausible story. This information is then reported to the Fire Attorney and the State Fire Marshal, who take charge of the cases at that point.

Another good feature of this work is the correction of defective conditions which exist in buildings where fires occur. Take, for example, a fire caused by a defective flue. The investigator informs the Bureau of the conditions, and the district inspector supervises the necessary improvements.

Altho this branch is still in the experimental stage, the results so far are very gratifying and encouraging, and the moral effect of the Squad is shown by the diminishing number of fires of suspicious origin.

C. W. HEJDA,
Chief Engineer, Bureau of Fire Prevention and Public Safety.

* See front cover, City Edition, this issue.

On the Calendar of Conventions

June 4-5.—Pittsburgh, Pa.
Pennsylvania State Association of Boroughs. Annual convention. Secretary, J. Herman Knisely, Capitol Building, Harrisburg, Pa.

June 4-6.—Chicago, Ill.
International Association of Fire Engineers. Annual convention. Secretary, Chief James McFall, P. O. Box 1015, Washington, D. C.

June 5.—Charlotte, N. C.
North Carolina Commercial Secretaries' Association. Annual meeting. Secretary, C. W. Roberts, Henderson, N. C.

June 5-7.—New York City.
National Municipal League. Annual meeting. Secretary, Clinton Rogers Woodruff, North American Building, Philadelphia, Pa.

June 6-8.—Boston, Mass.
National Association for the Study and Prevention of Tuberculosis. Annual meeting. Assistant Secretary, Philip P. Jacobs, 105 East Twenty-second Street, New York.

June 6-8.—Charlotte, N. C.
Southern Commercial Secretaries' Association. Annual meeting. Secretary, Morgan Richards, Selma, Ala.

June 11-13.—Newburgh, N. Y.
Annual Conference of Mayors and Other City Officials of the State of New York. Secretary, William P. Capes, 25 Washington Avenue, Albany, N. Y.

June 11-14.—Kansas City, Mo.
International Association of Chiefs of Police. Annual convention. Secretary, C. G. Kizer, Norfolk, Va.

June 13-14.—Atlantic City, N. J.
National Electric Light Association. Annual meeting, to be devoted entirely to war problems. Secretary, T. Commerford Martin, 29 West Thirty-ninth Street, New York City.

June 13-14.—Johnstown, Pa.
Pennsylvania Housing and Town Planning Association. Annual meeting. Secretary, John Ihlder, 130 South 15th Street, Philadelphia, Pa.

June 13-15.—Wrightsville Beach, N. C.
Tri-State Water and Light Association of the Carolinas and Georgia. Annual convention. Secretary, W. F. Stieglitz, Columbia, S. C.

June 17-20.—St. Louis, Mo.
National Association of Real Estate Boards. Annual convention. Executive Secretary, Thomas S. Ingersoll, 432 Andrus Building, Minneapolis, Minn.

June 17-21.—Kansas City, Mo.
International Association of Rotary Clubs. Annual convention. Secretary, Chesley R. Perry, 910 South Michigan Avenue, Chicago, Ill.

June 19-20.—San Antonio, Tex.
League of Texas Municipalities. Annual convention. Secretary, Professor H. G. James, University of Texas, Austin, Tex.

June 19-21.—Flint, Mich.
League of Michigan Municipalities. Annual convention. Secretary, Charles A. Sink, Ann Arbor, Mich.

June 20-22.—San Antonio, Tex.
Texas Commercial Executives' Association. Annual convention. Secretary, E. N. Farris, Corpus Christi, Tex.

June 21-22.—Williamsport, Pa.
Pennsylvania Commercial Secretaries' Association. Annual convention. Secretary, A. D. MacMillan, Reading, Pa.

June 25-28.—Atlantic City, N. J.
American Society for Testing Materials. Annual meeting. Secretary, Professor Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.

June 26-28.—Chicago, Ill.
American Association of Nurserymen. Annual convention. Secretary, Curtis Nye Smith, 19 Congress Street, Boston, Mass.

July 1-6.—Saratoga Springs, N. Y.
American Library Association. Annual convention. Secretary, George B. Utley, 78 East Washington Street, Chicago, Ill.

July 1-8.—Pittsburgh, Pa.
National Education Association of the United States. Annual meeting. Secretary, J. W. Crabtree, 1400 Massachusetts Avenue, N. W., Washington, D. C.

July 30-August 2.—Amherst, Mass.
Massachusetts Conference on Rural Organization. Annual conference. Secretary, Professor E. L. Morgan, Extension Service, Massachusetts Agricultural College, Amherst, Mass.

A Proposed Partnership Between the Improved Highway and the Parcel Post*

By Hon. James I. Blakslee
Fourth Assistant Postmaster-General

THE Post Office Department has attempted in a small way to function or utilize the improved highway, the modern motor vehicle and the parcel post feature of postal activity in such manner as will enlarge the means of communication, increase the avenues of conveyance and ultimately bring the original producer into as nearly direct contact with the ultimate consumer as is possible.

There are 2,199,646 miles of public roads within the United States. There are 1,222,753 miles over which no mail service is in operation. This means that anyone domiciled thereon, or engaged in any productive enterprise thereon, is in no direct contact with the outside world except that which he or they themselves provide.

The Improved Highway a Stranger to the Parcel Post

On the rural routes as established and now in operation, nine-tenths might be said to begin and end nowhere. In other words, they originate at 18,000 post offices in the United States, 15,000 of which are of such small size that they provide no market for the parcel post produce that might be transported over them.

It is a fact that of the 44,000 rural route avenues of communication between the original producer and the ultimate consumer but 250 emanate from the 50 largest post offices in the country, or, in other words, from the 50 best markets in the United States; and none of these 250 routes, because of the limited distance traversed, extend to the real farmer producer, or are of any material benefit to the millions of consumers located in the cities from which they start.

The 156,000 miles of highly improved hard-surfaced roads in this country are in the vicinity of these selfsame 50 largest post offices. Consequently the improved highway and the parcel post have not been introduced to each other as yet; they are, in fact, perfect strangers.

Now, with this evidence, together with the mass of additional data far too volu-

*From an address at the recent War Roads Convention, held in Columbus, Ohio.

FLEET OF FEDERAL TRUCKS IN THE U. S. POSTAL SERVICE

minous to here set forth in detail, it was not only essential, but obligatory, upon the Post Office Department to attempt to use the improved highway, and to place thereon the modern motor vehicle, which has developed within the last twenty years into a reliable and efficient device for the conveyance of both passengers and commodities.

We propose a program whereby not only the highly improved but many miles of ordinary roads may in a short time be used in the transportation of food products from the producer direct to the consumer, and thus compel the parcel post and good roads to be not only friends, but close relatives.

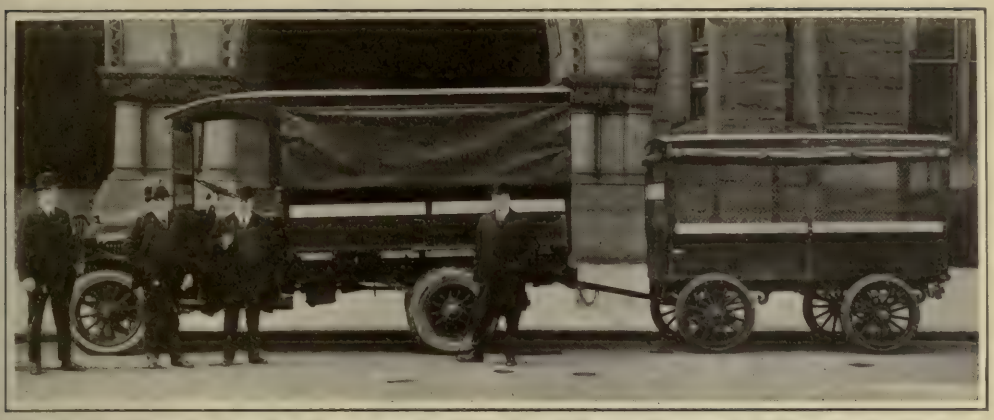
It is not necessary that the road shall be a boulevard to insure the collection and delivery of food; it would, of course, improve the celerity of conveyance if the road were hard-surfaced. Furthermore, in the long run, the permanent highway is more economical to the taxpayer. Nevertheless, whether the highway be constructed of concrete, brick, macadam, sand, clay, or any other type of material, the motor vehicle can be used thereon, and eventually will be used thereon, and will increase the zone of productive supply from which the people in metropolitan centers will secure the necessaries of life.

The Present Crisis

It was not absolutely necessary during the last three years to extend the zone of productive supply from the consumers in large cities to the real producer, for the reason that there was an ample stock of foodstuffs, at reasonable prices, and the unnecessary handling was not looked upon as an unusual burden. But to-day we have reached a crisis in our national welfare where it is vital that we eliminate every useless or inefficient operation incident to the collection and delivery of our dail bread.

We believed that the cities of New York Jersey City and Brooklyn were provide with the maximum transportation facilitie possible; that nowhere in the world wa there such a scheme of exchange by com mon carrier on land or water. Foreigner were awed by the tremendous number o trains, both freight and passenger, that ar rived and departed from this metropolita colossus. But there is not one single direc means of communication from the origina producer to the six million ultimate con

WHITE PARCEL POST TRUCK, EQUIPPED WITH GOODRICH SAFETY TREAD TIRES, ON A RURAL ROUTE



SPECIAL GARFORD TRUCK FOR RURAL DELIVERY ROUTES, WITH A SECHLER TRAILER, WHICH MADE A TOTAL RUN OF 663 MILES, FROM LIMA, OHIO, TO CINCINNATI AND WASHINGTON, D. C.

J. I. Blakslee, author of this article, is standing second from the left

sumers living in New York City, Jersey City, Brooklyn and vicinity, except that which is provided by the producer himself, by some mercantile establishment, familiarly known as "the middleman," or some enterprising trucking corporation, and those cover a zone extending not more than 40 or 50 miles from the cities named.

In the vicinity of Binghamton, N. Y., in northern Pennsylvania, is the dairy territory that to a large extent supplies some of the six million persons domiciled in New York. Eastern Pennsylvania, including northern New Jersey, produces vegetables, potatoes, radishes, and similar garden truck, largely for consumption in New York City and vicinity. In Lancaster County, Pa.,—the richest single agricultural county in the world—pork products, including the famous Philadelphia scrapple, and pigs' feet seem to be a preferred staple; at Mount Holly and Bordentown, New Jersey, tomatoes, beans and other garden truck of a similar character are canned; at Vineland, Hammonton and Egg Harbor City, N. J., thousands of chickens and eggs are produced—all localities within 150 miles of New York City, from which not one single egg, not one pound of pork products, not one bushel of potatoes and not one pound of butter is transported into New York City unless it is handled at least seven times and in some instances as many as 20 or 25 times, and there is not one of these handlers, whether truck driver, freight agent, or laborer at the transfer point, or anyone else identified with the movement of this produce, who handles a

GMC TRUCK TRANSPORTING RURAL MAIL

single pound, or a single barrel, or any number of pounds or bushels, unless some proportion of his salary is a part of the selling cost of the article he handles; and, necessarily, the more handlings, the greater the cost.

It is perfectly feasible, simple and practicable to employ a motor vehicle, one thousand motor vehicles, or any number of motor vehicles to assemble the produce at the door of the producer and deliver it, when in sufficient quantity, at the door of the consumer, and thereby eliminate a tremendous number of useless and unnecessary handlings or operations. This, in a few words, is the sum total of the suggestion for the efficient manipulation of food, within a distance of 150 miles from the vicinity of any good market center anywhere.

Putting the System in Operation

Of course, in the final analysis, it is important that the highways shall be of a character that will permit of regular, uninterrupted travel. Therefore, they should first be located, then improved and then maintained, and the methods whereby they should be built, improved and maintained should be simplified, especially where they are so vital to the successful transmission of food. All the complications, red tape, or conditions that delay and curtail the quick settlement of "when, where and for what purpose" should be reduced to a minimum; all the discussions, controversy and conflict as to who should establish the necessity for an avenue of communication, how or by whom it should be constructed, maintained or improved, should be settled.

The details of where funds are to be raised should be simplified. I know of a township in Michigan thru which there are seven miles of highway, and where the total assessed valuation of the township is but $15,000, showing conclusively that that township, or the population thereof, is in no manner capable of raising funds to thoroly improve the highway traversing it; there should nevertheless be no delay to a project for the improvement of a highway between two large markets simply because one township cannot afford to participate in the expense of such improvement.

It is certain that if the revenues to be derived from the conveyance of commodities over any highway are profitable,—when, in fact, they are as profitable as some of the routes already in operation,—there will be but one answer to this problem: a reduction in cost of the transportation to the patron, having due regard to the use of a part of the profit in the improvement of the highway over which the conveyance of the commodity is effected.

For illustration: A motor truck operating 100 miles a day may earn in the neighbor-

MAIL TRUCK (U. S. MOTOR COMPANY) USED IN BUFFALO, N. Y.

hood of $50,000 or $60,000 a year, at a gross expense of not more than $5,000 per annum, with every possible indirect or overhead expense included. In view of this evidence, it may be asserted that this excessive profit should be utilized in paying the losses that might be sustained on other establishments that were not so profitable; yet, no truck route should be established anywhere or continued in operation that failed to earn running expenses, and for the conveyances of all classes of mail matter, it is not an impossibility—in fact, it is not even difficult—to locate thousands of routes that will not only pay their expenses, but that will develop a credit surplus under the present rates of postage.

In the final analysis, a good road is necessary to the successful operation of a system of collection of food from the producer and delivery to the consumer. In less degree, it is necessary to secure a standard type of vehicle—a vehicle not so large that it will reduce celerity of movement—one that will be reliable. A complete system of distribution of conveyance, as contemplated, will require many vehicles, and it is good policy to so standardize the same that a single stock of parts will be interchangeable on all vehicles of any particular class or capacity.

Therefore, regardless of sentiment about particular features of high efficiency in the several types of vehicles, it is believed that the manufacturers of vehicles should coöperate in designing a single type, applicable to this character of transportation, and thus the Department could secure the vehicle desired from any factory anywhere without arousing competition, ill will or suspicion. Of course, the Department could particularize as to what are the universal features required, yet the experts engaged in the construction or manufacture of motor vehicles are so proficient in their lines, they are so thoroly acquainted with the details of construction, that they could no doubt jointly suggest a type of vehicle that would be the last word in efficiency.

This service should consist of trunk-line, or thru-connection routes, and feeder, or short-line, routes. The trunk-line routes should be located between large cities in order that a good market may be available at both ends of the route, and trucks would be loaded going both ways.

Feeder routes should be located from the cities at either end of the trunk-line routes, or from a proper point on the trunk-line routes where interchange of mails could be made and quick transportation to the markets provided. For instance, on the trunk-line route between Philadelphia and Baltimore, feeder routes would be established from Salisbury and Boston on the Eastern Shore of Maryland, and from Lancaster, Pa., thereby bringing producers in this great garden-truck territory into direct daily communication with the consumers in both Baltimore and Philadelphia; and every character of vegetable or fruit products collected each day should be delivered by parcel post to the ultimate consumer in the afternoon or on the first city delivery of the next day for all shipments.

A Research Bureau's War Service

For several months the Bureau of Municipal Research of Philadelphia has been operating a War Information Booth in the City Hall courtyard. An attractive pavilion "manned" by a paid staff of intelligent young women is located at the crossing of the city's two principal streams of foot traffic, and answers a large number of inquiries daily.

In a large city there are so many recruiting stations, Red Cross and other relief offices, employment agencies, and other centers of activity, that the eager volunteer, the troubled mother, the war gardener is at a loss where to go for information. The Information Booth acts as a clearing house and directs such inquirers to the proper source, or else answers the query directly. Among the usual topics of inquiry are the following: war gardens, activities of various war organizations, home service, food economies, recent war legislation, foreign mail regulations, enlistment, employment, location of cantonments and shipyards, housing, casualty lists, etc.

This service has proved a great conserver of both energy and enthusiasm and is universally regarded as a success.

SEDLEY H. PHINNEY,
Acting Secretary, Bureau of Municipal Research, of Philadelphia.

IF INSTRUCTION AND PRACTICE IN DENTAL HYGIENE IN SCHOOLS HAD ALWAYS BEEN AS GENERAL AS IT IS NOW, THE DRAFT BOARDS WOULD HAVE FEWER REJECTS ON ACCOUNT OF DEFECTIVE TEETH

What About Tuberculosis After the War?

By Edward A. Moree

WHEN this war is called "a war of science," the chemistry and mechanics of war-making are usually meant, but behind the lines, and often not so very far behind, either, the inexact sciences of sociology and economics are being applied. The social work that is being carried on here and in Europe is the retort in which the miserable admixture of disease and death is being distilled into real race improvement.

Principles of disease prevention and public health education which public health reformers have for years urged upon Congress, legislatures and county and city governing boards, are being applied in training camps and their surrounding territory under conditions ideal for the enforcement of regulations and the utilization of public health education. Housing problems created by the sudden shifting of large masses of laborers are being dealt with—in some cases too late—by housing experts. Recreation needs of the men in camps are being met by men who have developed their technique in the playground movement and the Y. M. C. A. Social diseases and segregated vice are now suppressed by the heavy hand of laws that have existed unenforced for years. Public health nurses are protecting the men in camp from infections from the surrounding territory. Relief problems created by withdrawing large numbers of men from productive toil are being handled under the Red Cross by experts developed in charity organization work.

The Long, Slow Fight for Public Health

It is safe to say that, in common with the writer of this article, everyone who has argued public health and social legislation before legislatures, boards and supervisors and city councils has met the "ultra conservatives" and the reactionaries in large numbers. They have set themselves up as the watch-dogs of public treasuries, and they bark even when the public, the real owners, approach their own goods.

I have in mind one city in New York State whose Board of Health opposed for years the establishment of a tuberculosis clinic, a visiting nursing service, school nursing and school dental clinics. That city now has all of these services, due to the steadfast efforts of the local anti-tuberculosis committee. But they came too late to help much in this fight. That city is located in a county whose board of supervisors has for ten years turned a deaf ear to every argument for the establishment of a county tuberculosis hospital. It would almost be possible to pick out of that community the men who have been rejected by the examining boards or who are now being returned from the training camps because of tuberculosis or lung weakness, who would now be able to serve the nation if the arguments of the public health reformers ten years ago had been listened to.

It is to be regretted that it is not possible to emphasize the positive value of public health work, to pick out of the new army those stalwart accepted ones who are

able to serve because of certain communities' enlightened public health work. But that is the way with public health work: its value and desirability are chiefly felt when it is absent. It is safe to say, however, that many doctors on the examining boards are able to pass as fit, men whom they recognize as having been under their care in tuberculosis clinics and hospitals.

Fortunately for this country and our allies, social work has progressed in spite of bitter opposition and dense misunderstanding. Had not the huge Foundations established by the Rockefeller and Sage fortunes been willing to continue their appropriations to public health and other social experiments, we should have been as poorly prepared for the strain of war in these respects as we were in munitions and soldiers. The tuberculosis situation in France became so alarming that a commission was sent from this country at the request of the French Government to make an investigation. The result of this investigation was the financing of a special experimental anti-tuberculosis campaign by the Rockefeller Foundation and a very active coöperation between the Red Cross and the Foundation in applying to the French situation the experience and knowledge we have built up in our own most successful anti-tuberculosis campaign in this country—originally financed, by the way, by the great Foundation established by Mrs. Russell Sage.

Progress in Anti-Tuberculosis Work

Probably none of the movements for social betterment is better known nor has accomplished more substantial results than this anti-tuberculosis campaign. The leaders of the National Association for the Study and Prevention of Tuberculosis have never found it necessary to revise their original thesis that tuberculosis, the disease of the masses, constituting the greatest drain upon the vitality of the community, is preventable and curable.

To just the extent that the measures which the Association has advocated have been adopted are we now protected from the disaster of a vastly increased death rate from tuberculosis such as afflicted our already sorely tried ally; to just the extent that the reactionaries who pooh-poohed the statistics have succeeded in their efforts, are we unready to meet that vastly increased strain.

Now a tuberculosis hospital means an institution to meet a definite national need in the care of invalided soldiers. Now a tuberculosis visiting nurse is a most important factor in the home treatment of sick soldiers. Now we know what conservation of the nation's man power means when we see the effects of lack of conservation interpreted in terms of percentage of rejects from the National Army. We not only have the machinery with which to deal with the increased tuberculosis that the war will cause and that it already has brought to light, but we have built up a corps of experts who, in France, are contributing largely to the relief of what was rapidly becoming a desperate situation.

Failure to respond to the appeals for ad-

TOWN HALL, FRAMINGHAM, MASS.
In the town meetings held in this building the citizens have shown a direct response to various suggestions made by the Health Demonstration's officials

equate public health work in those states and communities that have not responded, is one of the unclean spots in our social fabric which the war will wash out. In this fact lies the wisdom of the present appeal of the National Association for the Study and Prevention of Tuberculosis for 5,000 new members. The war is the laundry that is bound to cleanse our social fabric, but it is societies like the National Association for the Study and Prevention of Tuberculosis that must do the scrubbing. Preparedness for peace means not only getting ready to meet the new responsibilities which must inevitably force themselves upon every community in the country, but it also means preparedness to resist the reactionary forces that will inevitably arise, even in spite of our increasing enlightenment, to hold us back in the same channel of error that made it difficult for us to meet the responsibilities of war. It should never again be as difficult as it has been in the past to get our representatives—national, state, county and municipal—to accept the recommendations of anti-tuberculosis societies and other public health agencies.

Out of the vastly increased public health activity due to the war a fund of convincing data is already being gathered. This, of course, is true of all war surgery and medicine, but it is equally, even if more obscurely, true in the case of war public health work.

One very notable undertaking of the National Association for the Study and Prevention of Tuberculosis will serve admirably to illustrate my two main points: (1) the contribution of social agencies to the country's equipment for making war; and (2) the benefits that are bound to accrue thru our war social experiences.

An Important Health Investigation

Early in 1916, the Metropolitan Life Insurance Company set aside $1,000,000 to be expended under the direction of the National Association in a most unusual health experiment to answer six questions:

1. Is it possible to discover and to place under adequate medical, nursing and relief supervision all of the cases of tuberculosis, incipient and advanced, active and arrested, in a normal industrial community?
2. Is it possible to ascertain with some degree of definiteness the responsible social and economic factors in disease causation, particularly as regards tuberculosis?
3. What is the most efficient utilization of the existing means available for the discovery and treatment of disease?
4. What percentage of theoretically prevent-

THE LABORATORY OF THE FRAMINGHAM NORMAL SCHOOL WAS A BUSY SCENE DURING THE WEEK THAT 2,500 CITIZENS OF THE COMMUNITY WERE EXAMINED

LARGELY ON ACCOUNT OF THE IMPETUS GIVEN BY BABY WEEK, FRAMINGHAM'S INFANT DEATH RATE WAS REDUCED FROM 81 PER 1,000 LIVING BIRTHS TO 69.6

able disease is practically preventable with the use of known but unused, or at least uncoördinated, instruments?

5. How can social forces best be used to prevent unnecessary sickness and death, particularly from tuberculosis?

6. Practically, what is the ideal community health machinery for meeting those ends? What are the essential factors in an adequate preventive, detective and remedial mechanism?

The experiment has now been under way for a little more than a year, beginning shortly before we entered the war. In some respects it has been helped by the war, in others hindered. Like nearly every other social movement, however, its need is emphasized by the social strain of the war.

The Framingham Experiment

The city of Framingham, Mass., was chosen as the seat of the experiment, after a long and careful search. It combines to an unusual degree certain essential features, chief among which are its mixed industries, city, suburban and rural population, varied races, good state and local health organizations, a normal amount of disease, particularly tuberculosis, well-trained physicians, good hospitals and a promise of adequate community coöperation.

The demonstration started out with no thesis. It is putting the inexact science of sociology on as nearly an exact basis as the human element will permit. The demonstration, however, is not a piece of community vivisection. So diplomatically have its affairs been conducted that it has become a part of Framingham itself. It is really an experiment in enlightened community health work, taken up at the suggestion of an outside agency that was in a position to partially finance it.

The extent to which the experiment has become a part of Framingham's life and ambitions is illustrated by the greatly increased appropriations for various health activities made in town meetings at the suggestion of the demonstration committee. The health officer devotes his whole time to the work. A tuberculosis nurse and a full-time baby welfare nurse have been employed. Abandoned rural schools have been converted into children's summer health camps. An annual expenditure of $7,500 for health work has been increased to $15,000 by an overwhelming vote of the taxpayers at town meeting.

Results of the Experiment

With laudable conservatism, the committee in charge of the demonstration refuses to draw conclusions from its first year of activity. It already seems likely, however, that at least one statistical theory in regard to tuberculosis will be exploded.

Laws compelling the reporting of cases of tuberculosis have scarcely ever succeeded in registering more than three living cases to every death from the disease. In the early days of the anti-tuberculosis movement, a figure of five living cases to every reported death was accepted as being a conservative approximation to the actual situation. This figure was based upon cer-

tain studies made in Europe and rather careful surveys over relatively small areas in this country. Later this figure was revised slightly upward as the diagnostic skill of our physicians increased.

The first year of Framingham's community health demonstration seems to show that this estimated ratio is far too low. So thoroly has the demonstration become a part of the town that approximately 5,000 persons, or one-third of the population, have offered themselves for examination. Out of this number, approximately 140 have been found to be tuberculous, and no case is listed as tuberculous unless the diagnosis is definite.

The officers in charge of the demonstration will permit no prediction on their authority as to the number of cases which may be discovered in an examination of the remaining two-thirds of the population. The one-third which has been examined includes all classes, from mill workers to well-to-do commuters. While it is likely that the percentage of cases will be reduced in future examinations, it seems extremely unlikely that it will be reduced more than one-third. Framingham has had in the last ten years an average of approximately fifteen deaths per year. Using only the 140 cases discovered in the examination of one-third of the population there are already on record enough positively diagnosed tuberculosis cases to give a ratio of nearly ten living cases to each reported death.

Communities that fancy themselves relatively free from tuberculosis because few cases are reported might apply Framingham figures to their average annual number of deaths and arrive at a more nearly accurate picture of their tuberculosis situation than their recorded cases give them.

Incidentally, it might be worth while to point out that the figure of 3 per cent of positively diagnosed tuberculosis among the first 5,000 examined approximates the results from the examination of the men drafted for the National Army and the recruits in the training camps.

The committee in charge of the demonstration insists that it would be folly to expect results of even the very enlightened methods of disease prevention to show so soon in the death rate of Framingham. At the same time, a layman finds most interesting a comparison of the death rate of 12.04 for 1917 with the average of 13.65 for the last ten years. In fact, to the lay mind these figures must have considerable sig

THE FRAMINGHAM VILLAGE SQUARE DURING BABY WEEK WAS THE SCENE OF A GRAPHIC DEMONSTRATION OF THE RIGHT AND WRONG WAYS TO HANDLE MILK

nificance, particularly in view of the fact that the infant death rate has rather astonishingly decreased. This is always the first place in mortality statistics for enlightened public health work to show itself. In past years the infant death rate in Framingham has averaged 81 per 1,000 living births. The infant death rate in 1917 was 69.6 per 1,000 living births.

If Framingham were almost any other community under the sun, this decrease would be attributed by its health authorities to the preventive measures which have been adopted. And, indeed, why not? An extensive baby-saving campaign was carried on last spring, resulting in a vastly increased knowledge, among the mothers, of modern baby care. Not only were mothers instructed in the care of their offspring, but expectant mothers were carefully instructed in those hygienic precautions which go far to insure healthy babies.

In addition to this baby campaign, the full-time baby nurse has, day in and day out, carried modern instruction in baby welfare into practically every home in the community in which there were children. This all means baby lives saved and just that many deducted from the death rate.

No one can tell at this time how Framingham's demonstration will answer the questions propounded. The apparent results set down in this article are really not results at all. They are merely by-products. It is safe to say, however, that whatever the answers may be to the six problems, there will be at least one important result. It has proved already that it is possible for a democratic American community to adopt a modern health program and carry it into effect with the coöperation of practically all the citizens. If the statements of Framingham physicians may be taken as a test, there was less sickness in the town this extraordinarily hard winter than ever before.

Without consulting the committee and without unduly assuming the prerogatives of a prophet, I am going to make a prediction: as the cities and rural towns of this country settle down to the business of applying the social lessons of this war, Framingham will be the Mecca for many a pilgrimage. The National Association in fostering this demonstration will by that time have shown either how to or how not to conduct a community health program.

Editorial Note.—Mr. Moree, the writer of this article, was for seven years active in the publicity and legislative phases of the anti-tuberculosis campaign in New York State, having been instrumental in the establishment of county tuberculosis hospitals in some twenty counties. He was also, for three years, Advisory Expert in public health education of the New York State Department of Health, and Assistant Secretary of the Governor's Special Commission that investigated public health administration in that state and secured the enactment of the state's present model public health law. He was also formerly Director of the Atlantic Division of the American Red Cross.

The Community Health and Tuberculosis Demonstration at Framingham has issued the first of a series of publications telling the story of this $100,000 experiment. Monograph No. 1 is entitled "The Program."

Meetings of City Department Heads

To The Editor of The American City:

In your April issue, I note an article by Mr. Henry R. Minor, Street Commissioner and City Engineer of Norwalk, Conn., entitled "City Departments Get Acquainted," detailing certain bi-monthly meetings of department heads, etc.

This is an excellent way, in my opinion, of keeping various department heads of municipal government acquainted with all of the work under the general head of the government. Our present mayor, Hon. James H. Preston, who went into office in 1911, inaugurated similar meetings, held weekly.

At these meetings there are no prepared talks like those mentioned in the article by Mr. Minor, but each department head is called upon to outline the work for his department for the week previous and as far as possible for the current week.

The Mayor calls upon each department head for his report. General discussion is entered into; and in case of construction work in which other departments are concerned, points are brought up of interest to all. Every phase of the management of municipal affairs is discussed.

The meetings have been carried on since 1911, showing that the idea was a good one and one which, no doubt, will be followed by succeeding administrations.

R. MAVIN COOKSEY,
Highways Engineer.

Let Us Have a Worthy Observance of the Fourth

A Plan to Visualize to Every Citizen of Whatever Nationality the Continuity and the Unity of Our Declaration of Independence

ON the coming anniversary of the declaration of our independence, New York will have an opportunity to give an inspiring spectacle to the country and to the world. Let us not miss that opportunity.

The traditional celebration of the Fourth of July in this crisis of history would be an absurdity. We must devise an observance in keeping with the position which America is occupying as the conserver of the world's liberties; an observance that shall visualize the continuity of the struggle to make man free.

The American revolution is not an isolated fact in history. The Declaration of Independence issued by the thirteen colonies was the summary and the culmination of the aspiring toward freedom that began with the beginning of history. In that document spoke the victors of Salamis, who decreed that Europe should not be a Persian province; spoke the democracy of Rome, crushed eventually by the imperialism of the Caesars; spoke the English race, sturdy victors over King John in the terms of the Magna Charta. The soul of France, struggling toward the light amid the darkness of the night that preceded the lurid dawn of the revolution, found expression in that thesis of world-liberty.

To the principles of the freedom of peoples as promulgated thru centuries of striving, the American Declaration of Independence added yet another note of vast significance. It emphasized and proclaimed the value of the individual, not as a means to an end but as an end in himself. To that extent our covenant of freedom rose higher than the declaration of the Greeks, who fought bravely for national independence while they perpetuated the helot class; higher than the political doctrines of the Roman democracy, which safeguarded the free citizen but kept the slave caste under the strictest subjection; higher than the English Magna Charta, which enunciated the right of trial by jury but did not make it impossible for centuries to come for the king's officers to hang a man for snaring a hare.

The international character of America's achievement for the independence of a nation and the freedom of the individual is emphasized by the names of the men who made the protest a legal and political fact. The names of Washington, Franklin, Hancock, Lafayette, Rochambeau, Von Steuben, Kosciusko, Pulaski, Barry, Sullivan and Wayne have left the impress of a solemn international act upon the American revolution.

Let us visualize this world achievement in New York's observance this year. Let us organize a pageant that will bring the continuity and the unity of our Declaration of Independence home to every citizen and to every resident of whatsoever nationality or origin.

Let us have a series of historic floats that shall picture the notable phases of the universal struggle among all nations—phases which have either contributed to our declaration or have sprung from it. Let these floats travel in procession thru the length of New York.

Let us make every Italian who sees this pageant realize that we are commemorating the sacrifices of his ancestors to the cause which found fulfillment in the act of the thirteen colonies.

Let us make every Greek feel that he is realizing in America the dream of Socrates and the triumph of Thermopylæ.

Let us make every Pole understand that America is the flower that has sprung from the blood of the Polish martyrs who gave their lives in vain attempt to make Poland free.

Let us make every Swiss feel that the success of Washington marked the victory of the principles for which, in the words of the legend, Willian Tell beheld his son face the arrows of the Austrian archers.

Let us give every Hungarian the realization that the battles that Kossuth fought

were an echo and a result of the war that the colonists waged to make taxation without representation impossible.

Let us present to the eyes of every citizen of German origin the fact that the struggle of the German people for liberty in '48 was a response to the triumphant declaration of our own freedom.

Let us place before the eyes of all the races that make up our population the striking incidents in the struggles of their own peoples for freedom. Let us make the Gracchi, and Thermopylæ, and the defense of Warsaw, and William Tell, and Louis Kossuth, and the '48-ers of Germany pictures in that pageant.

Such a pageant would impress upon each citizen of every race the part that his own blood has taken in the cementing of the structure of American liberty which we are now defending. It would stimulate unity and the spirit of sacrifice among all our citizens of various racial strains by pointing out in visible terms America's vital mission in keeping aflame the white torch of liberty which has descended to us and which we have transmitted to all the world.

—*From the New York Evening Mail.*

A Public Citizenship Day on July Fourth

A Program Recommended by the Civic Department of the General Federation of Women's Clubs

THE General Federation of Women's Clubs during its Biennial Session at Hot Springs, Arkansas, April 27 to May 8, approved of a plan submitted by its Civics Department for the promotion of a public Citizenship Day in every community on July Fourth of each year. It is hoped that such an occasion will promote patriotism, increase the understanding of American ideals and impress each new citizen with a sense of his civic responsibilities. Such a day participated in by the whole community will also be productive of greater social solidarity and a more conscious community spirit. The club movement is so extensive and the women are so interested in civic enterprise that their adoption of a resolution to urge every federated club to promote a public Citizenship Day in each Community, should make it quite certain that July Fourth of this year will see a nation-wide celebration in honor of American citizenship. The following program is the one commended to the women's clubs by the Civic Department of the General Federation:

I. Procession—Court house to civic center or park.
- City and county officials
- School officials and teachers
- Class A—Citizens of twenty-one with right to vote by birth
- Class B—Newly naturalized citizens
- Local military units, lodges, etc.
- Junior organizations.
- Bands, etc.
- Floats

II. Program
- Address
- Oaths of allegiance, renunciation of country of birth by foreign-born
- Flag salute
- Pageant—either the "Gifts of the Nations" or appropriate local or national episodes

III. Recreation
- Public collation
- Games
- (Booths may be introduced here where thank-offering subscription to Liberty Bond issues or purchase of Thrift Stamps and War Savings Certificates may be made, and contributions to Patriotic Leagues, Red Cross and War Camp Community Funds subscribed.)

IV. Evening program
- Plays by local talent, appropriate motion pictures, balls, etc. (Funds for expenses incident to such a celebration may be raised by the evening program events.)

Items of Municipal Law

By A. L. H. Street

Liability For Insufficient Fire Protection

A municipality is not liable in damages for failing to furnish water mains of sufficient size to afford adequate fire protection, altho it may result in loss of a complaining person's property, according to the recent decision of the North Carolina Supreme Court in the case of Howland vs. City of Asheville, 94 Southeastern Reporter, 524. In this case, the Court said:

"The defendant is not liable in such cases, because it is performing the functions of government, where the whole community is affected in the same way, tho not all perhaps in the same degree, and is not performing an act of a business nature for its own benefit. * * * In this case there was no statutory liability imposed on the defendant, and no special contract with the plaintiff, as she was being served just as were other citizens of the same community, there being no extra charge made to any of them for the use of water at fires, if such a payment would make any difference, which we do not decide, as it is not necessary to do so. The fire department was intended for the common benefit and protection, and was maintained at public expense. There is no view of the facts disclosed by this record which would justify a recovery by the plaintiff."

✣ ✣

Regulation of Junk Dealers

An ordinance of the city of El Paso is invalid for unreasonableness which purports to require junk dealers to keep a record of all their transactions, describing articles received, and the names and addresses of the persons from whom received, open to inspection by the chief of police; which requires daily reports to be made to the chief of police; which forbids purchase of property marked as belonging to a firm or corporation, unless the seller shows himself to be the lawful owner; which requires that purchases be kept set apart for two days; and which forbids keeping open of such places of business before 6 a. m. or after 7:30 p. m., there being no statutory or charter authority for such ordinance. (Texas Court of Criminal Appeals, Ex parte Goldburg, 200 Southwestern Reporter, 386.) But the ordinance of the city of Chicago forbidding location of a junk shop in a block in which two-thirds of the buildings on both sides of the street are residences or stores, without the written consent of a majority of the property owners on both sides of the street in that block, is a valid regulation. (Illinois Supreme Court, Smolensky vs. City of Chicago, 118 Northeastern Reporter, 410.)

✣ ✣

Revocable Railroad Permits

Permission granted in 1881 by the aldermen of Raleigh, N. C., to a railway company to occupy a sidewalk "for the purpose of running a track," this being many years after the railroad was constructed into the city and no time for enjoyment of the permit being stated, is revocable by an ordinance directing removal of the track. In such case the railway company can claim no vested right to permanently occupy the space. (United States Supreme Court, Seaboard Air Line Railway vs. City of Raleigh, 37 Supreme Court Reporter, 8.)

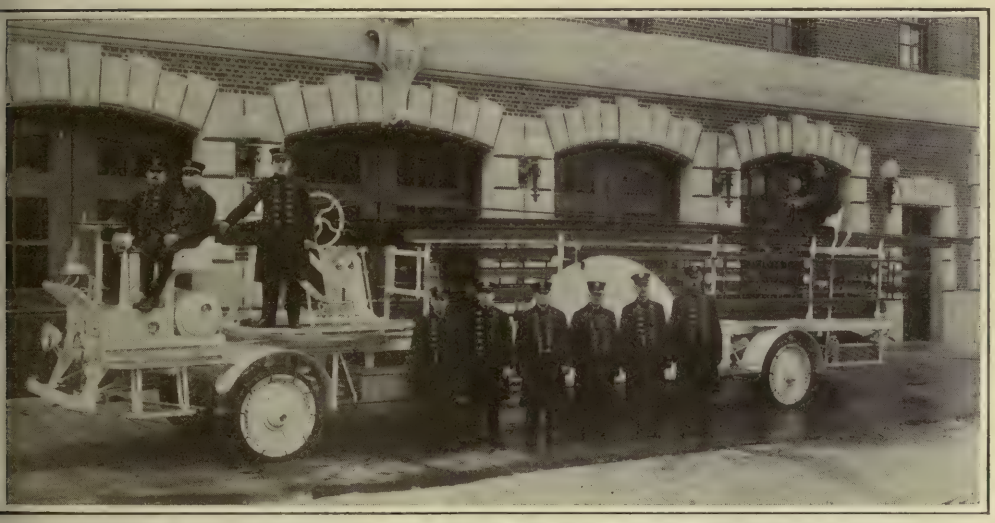
✣ ✣

Operation of Municipal Utilities

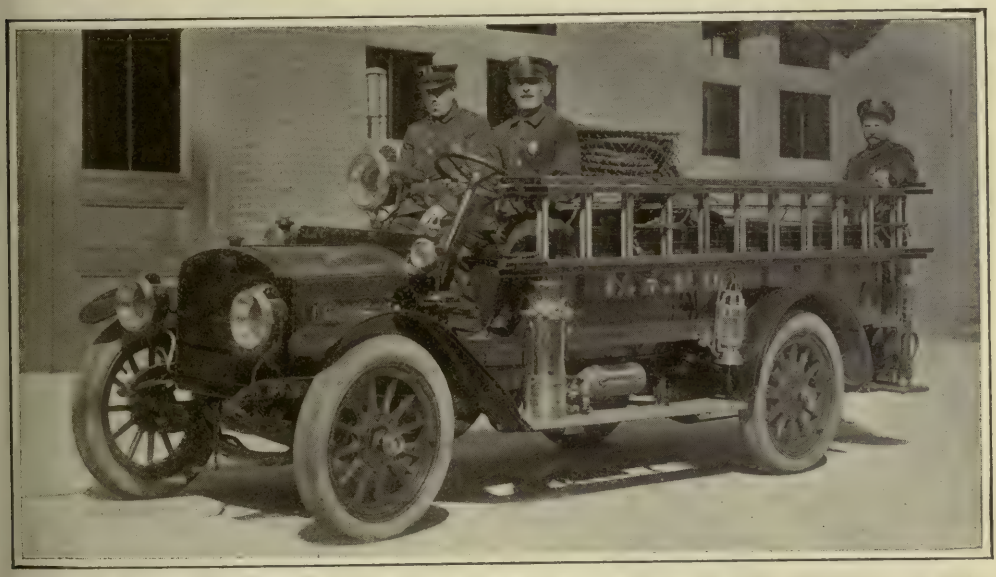
Municipal officials charged with control of city-owned plants furnishing light, power or heat to the inhabitants of the city have a broad discretion, with the exercise of which the courts have no power to interfere on complaint of a taxpayer merely that the capacity of a plant is overtaxed and that the streets are insufficiently lighted because of sale of electric current to private consumers; and that the rates charged for private consumption are inadequate to meet the costs of production and transmission. But a court has jurisdiction to restrain a municipal practice under which the city council leaves the matter of rates to administrative officers and they unjustly discriminate between citizens in the matter of rates and service. (Ohio Supreme Court, Butler vs. Karb et al., 117 Northeastern Reporter, 953.)

Examples of Motor Apparatus in Use by Municipal Fire Departments

These Are Times When Cities Must Make Special Effort to Secure Adequate Fire Protection—In Spite of the Urgent Necessity for Conservation During War Time, the Fire Losses for 1917 in the United States Were the Largest for Ten Years



COUPLE GEAR AERIAL TRUCK IN USE BY THE FIRE DEPARTMENT OF NEW BEDFORD, MASS.



GMC COMBINATION HOSE WAGON AND CHEMICAL TRUCK IN THE SERVICE OF THE CITY OF NORTH ANDOVER, MASS.

News and Ideas for Commercial and Civic Organizations

Food Conservation Signs on Wisconsin Capitol Building

MADISON, WIS.—In the accompanying photograph of Wisconsin's new $7,000,000 state capitol appears one of the four food signs which have been erected upon the building by the Madison Association of Commerce, in coöperation with the Superintendent of Public Property, M. F. Blumenfeld.

STATE CAPITOL AT MADISON, WIS., SHOWING ONE OF THE FOUR FOOD SIGNS ERECTED UPON IT BY THE MADISON ASSOCIATION OF COMMERCE

Wisconsin is doing her bit toward helping to win the war. Every war campaign which has so far been waged in the state has been very successful, which is evidence that the rank and file of the people of Wisconsin are standing back of the Government.

DON E. MOWRY,
General Secretary, Madison Association of Commerce.

Home Demonstration Canning Clubs

GASTONIA, N. C.—When the subject of food conservation was new the country over last summer, the Gastonia Chamber of Commerce, thru its Department of Civic Affairs, launched an important work in food conservation in this busy little North Carolina city which had even better results than the organization at first anticipated. Thru it, home demonstration canning club activities, hitherto carried on in the country, were brought to town.

The department's final report shows that, at an expenditure of $130, thirty canning clubs were organized in Gastonia and a total of 39,073 cans were put up by the club members. The Chamber of Commerce, in the process, acquired an important asset

epresenting a part of the expenditure—a omplete canning and dehydrating equipment. This was not allowed to lie idle luring the winter months, but was used rofitably in the mill villages surrounding astonia's many large textile mills.

A local school teacher was placed in harge of the home demonstration activies. The work began on June 18 and nded on August 18, 1917. During this eriod the thirty clubs were organized, with membership of 373. Seventy-seven demnstrations were conducted by Miss Copeand during the two months. Three public alks were given besides the demonstraions. Both fruits and vegetables were anned.

The work was conducted entirely among e housewives, and included everyone, rom the more humble cottagers in the mill illages to the most prominent residents in e city. Separate clubs were formed in irty different sections of Gastonia, and e work was most thoro.

The number of cans put up does not by ny means represent the full extent of the ork; its more permanent results are apparnt in the added interest which was aroused the subject of food conservation. The ork will be resumed this summer, and ith the foundation that has been laid it s expected that even greater results than st year's will be realized.

FRED M. ALLEN,
Executive Secretary, Gastonia Chamber of Commerce.

"A. Patriot, Grocer"

OTTUMWA, IOWA.—The Ottumwa Commercial Club, thru its Farm Bureau, has proved, at least to the Ottumwans, that Mr. Hoover's food edicts are not only practicable, but health-restoring measures. The War Emergency Home Demonstration Agent attached to the Club and the Farm Bureau set up a so-called Liberty Grocery, with "A. Patriot" as proprietor, in the parlors of the Commercial Club, composed of the articles on Mr. Hoover's list of substitutes for the articles we are conserving in order to be able to send them to our allies. The number of tempting viands exhibited was an eye-opener to those who have been declaring that there is nothing left to eat in this country. The people have felt that if they must be limited in their use of white wheat flour, their hands are tied; that when beef and pork must be rationed, there is little else to serve; and that when sugar is scarce, there are no substitutes.

"LIBERTY GROCERY, A. PATRIOT, PROPRIETOR"

The exhibit of the Ottumwa Commercial Club, showing the many substitutes for wheat, meat, sugar and fats that are obtainable

Various wholesale and retail merchants of Ottumwa donated the substitutes for wheat, meat, fat and sugar that have been recommended by the food experts. These were classified under their proper headings, with placards containing suggestions of ways to prepare them for the table, under such posters as, "How Easy to Save Wheat by Using These," "Who Cares How Many Meatless Meals We Have When We

Modern Lighting Method

THE OLD WAY

Two sets of poles.

Tubular steel for supporting trolley wires.

Cast iron standards for lighting.

DOUBLE EXPENSE

Unnecessary obstruction along the curb line.

Underground wiring absolutely necessary.

Difficulty of keeping both sets of poles in alignment.

THE ELRECO WAY

One set of Elreco combination p

The addition of ornamental bra and base transforms the ordinary trolley pole into a handsome ligl standard.

"White Way" is obtained at less one-half the cost of a separate inst tion.

Lighting wires may be attache top of poles—saving all expe underground construction.

Curb line free from all unnece obstruction.

Get full details and catalog

Electric Railway Equipment Co

Manufacturers **Cincinnati, Oh**

NEW YORK OFFICE **30 CHURCH STREET**

Can Substitute These?", "Why Worry About a Scarcity of Butter and Lard When We Have These?", "Eat Potatoes; Eat 'em Boiled, Baked, Mashed, Hashed." There were thirty-two varieties of wheat substitutes, thirty-eight substitutes for meat, fifteen substitutes for sugar, and fourteen substitutes for butter and lard, all of which proved that there was no immediate danger of the country's going hungry, and that it was still possible to vary the diet endlessly and palatably without using the so-called "unpatriotic" foods.

American dietitians have been saying for many years that the people of this country do not eat enough of the foods which are rich in mineral salts, phosphorus, calcium, and magnesium, and which are not only excellent meat substitutes, but by many people are considered superior to meat. A few samples of those foods were displayed, such as dried peas, dried beans, string beans, milk, eggs, almonds, walnuts, and peanuts. Some of the wheat substitutes were rolled oats, corn meal, and such vegetables as turnips, parsnips, carrots, and spinach. Among the sugar substitutes were dried prunes and raisins. Students of food values are of the opinion that this war emergency food substitution is one of the best things that could happen to us.

There were also displayed some balanced day's rations for the adult and the young child. Bulletins giving valuable recipes and suggestions were distributed.

A "Vacant Lot Slacker" was shown, with its accumulated rubbish, side by side with a thrifty garden plot called "Vacant Lot, Patriot." Then came a display of the vegetables that should be raised in greater abundance this year—carrots, parsnips, sweet potatoes, turnips, sugar beets, with a placard admonishing the visitors to "Raise More of These and Less Radishes and Lettuce."

There were also shown some reliable brands of rubbers for use in sealing glass jars, with a suggestion that the housekeepers avail themselves of a good supply of them before the coming season opens.

The city librarian contributed a number of excellent books on Food Conservation, the Study of Foods, Gardening, the Bee Industry, etc., also many attractive war posters.

(MISS) MARIEL HOPKINS.
War Emergency Home Demonstration Agent, Ottumwa Commercial Club.

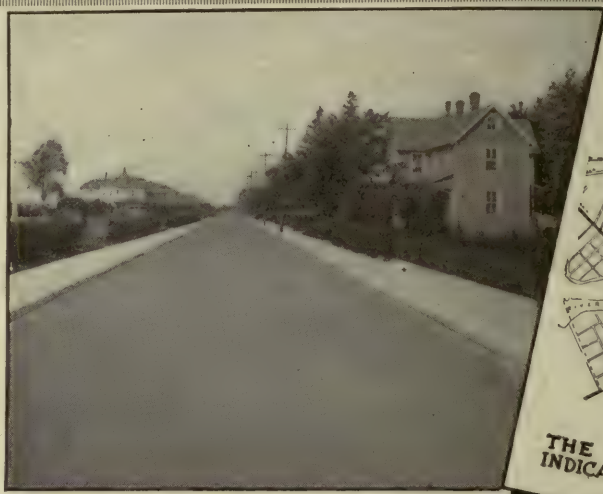
Literature on Food Production and Conservation

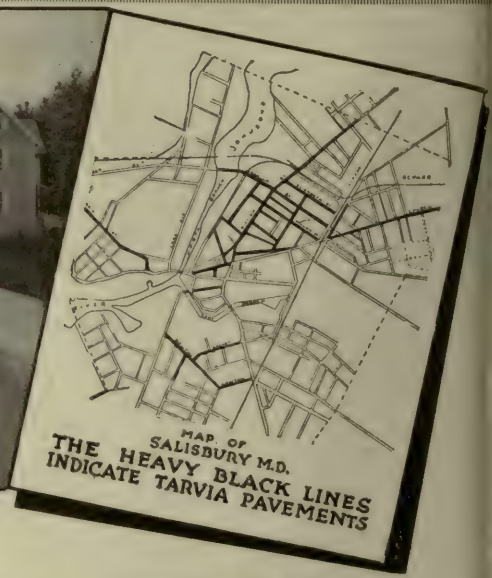
Bridgeport, Conn.—The Agricultural Department of the Fairfield County Association for Mobilization of Resources (the headquarters of which are in Bridgeport), is distributing a great deal of valuable literature on the production and conservation of food. There are bulletins giving recipes for bread-making, canning, drying and evaporating, on the storage of vegetables, or how to save butter, etc. The bulletins are gotten out monthly, and are distributed far and wide thru the courtesy of the various public service corporations and the larger stores in the different communities of the county. The Association always plans to have the bulletins ready about the fifteenth or twentieth of the month. They are made the right size to go into an ordinary small commercial envelope, and the business houses enclose them with the invoices that are sent out the first of every month. This distribution is made without any cost whatever to the Fairfield County Association.

In order to reach the poorer families, representatives of the Fairfield County Association visit the small stores in the cities and villages of the county and arrange with the storekeepers to place a bulletin in every package that leaves their stores. Altho this duplicates the distribution to a great extent, the plan of having the storekeepers help in disseminating this information makes it certain that the literature gets into the hands of from 80 to 95 per cent of the population.

The Association is also distributing a garden primer, published by the National War Garden Commission. Its title is "War Vegetable Gardening and the Home Storage of Vegetables;" it is thus both a war garden manual and a home storage manual. A special cover bearing the name of the Fairfield County Association was made for it, and it is being sold in large quantities for five cents a copy. These primers have been taken by banks, department stores, schools and garden clubs and are usually given away by them. The Fairfield County Association has a large stock of the primers which it is willing to dispose of at $25 per thousand.

E. F. VON WETTBERG.
Chairman, Fairfield County Association for Mobilization of Resources.





East Division Street, Salisbury, Maryland. Treated with "Tarvia-B" in 1916.

Six Miles of Tarvia in Salisbury

In Salisbury, Maryland, on the eastern shore, good-road building-materials are scarce and hard to get.

Long years ago it was discovered that the oyster-shells could be used as a substitute for more lasting materials.

The coming of the automobile, however, made the oyster-shell road a joke.

The City of Salisbury, however, tarviated their shell roads in 1916 with such good results that it may safely be predicted that to the inhabitants of Salisbury Tarvia will become a synonym for a good road.

Tarvia
Preserves Roads
Prevents Dust~

The Mayor of Salisbury writes:

"The Tarvia used for the treatment of our shell streets during the year 1916 has turned out very satisfactory.....In my opinion this material gives the best satisfaction at the least cost of any material that we can use on streets that do not have heavy truck-traffic. We are arranging to treat the same streets again this year, and believe that we will not need to do any more to them for several years.

(Signed) "I. E. JONES, *Mayor*."

This is but one of the many interesting problems that are solved by the Special Service Department of The Barrett Company.

Today the Nation needs good roads more than ever before. The motor-truck traffic is growing by leaps and bounds owing to the great railroad congestion.

No other material is adaptable to so many road problems as Tarvia. It is made in several grades to meet varying road conditions.

Illustrated booklet showing roads of various kinds all over the country that have been successfully and economically treated with Tarvia free on request.

Special Service Department

This company has a corps of trained engineers and chemists who have given years of study to modern road problems.
The advice of these men may be had for the asking by any one interested.
If you will write to the nearest office regarding road problems and conditions in your vicinity, the matter will have prompt attention.

New York, Cleveland, Kansas City, Chicago, Cincinnati, Minneapolis, Philadelphia, Pittsburgh — **The Barrett Company** — Nashville, Boston, Detroit, Salt Lake City, St. Louis, Birmingham, Seattle, Peoria

TRADE B MARK

THE BARRETT COMPANY, LIMITED: Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.

A Fine Halibut Market at Seward, Alaska

SEWARD, ALASKA.—Some fine, large halibut banks are located only forty miles from Seward on the bay on which Seward is situated. The halibut is of a very superior quality and has been taken from these banks by the ton for a number of years. Fish experts, after due prospecting, have advised the Seward Chamber of Commerce that the banks contain enough halibut to supply the world for generations. The Chamber of Commerce is conducting an advertising campaign in an effort to make this port the principal fishing center in Alaska and one of the most important halibut towns in the world.

LEANDER L. JAMES, JR.,
Secretary, Seward Chamber of Commerce.

The Home Guard of Youngstown, Ohio

YOUNGSTOWN, OHIO.—The Home Guard of Youngstown, now known as the First Regiment of Youngstown Volunteer Infantry, was organized about a year ago. When the National Guard was federalized and withdrawn, it was felt that this city, containing a large number of enemy aliens out of a total population of 115,000, should have more ample protection than that afforded by the Police Department. The Military Affairs Committee of the Chamber of Commerce, therefore, offered to finance an ample guard. Experienced military men were called into consultation, and after a survey had been made, they recommended that a regiment of sixteen infantry companies and one machine gun company be formed, the regiment to be divided into four battalions of four companies of 75 men each, located in four districts—north, east, south and west.

The regiment was formed and was armed, one-half with Springfield 45-70 rifles and one-half with night sticks. Each company drills one or two nights every week, and battalion drills are held frequently. The regiment is uniformed with cotton khaki uniforms, and as it is splendidly drilled, it makes a good appearance. There was no suitable armory in the city in which to drill, and the Military Affairs Committee was obliged to build a large drill shed. Two companies drill each night, so that every night there are two uniformed and armed companies on the streets, going to and from the drill hall. The psychological effect of having well-trained, equipped and uniformed men in evidence so often is good, and there has been no hint of any disturbance since the regiment was formed, altho there were many threats before this step was taken.

The entire regiment has turned out on several occasions, and details of companies and battalions have acted frequently as escorts at military funerals, patriotic parades, etc.

An officers' school is held every Monday night, in which special attention is paid to riot work, mobilization, etc. A rifle range is open every evening, and every man in the regiment is being taught how to shoot. Trophies are offered for good marksmanship. As soon as the weather conditions will permit, competitive drills in open order formation will be held.

Of the 98 men from the regiment who have gone into service since the guard was organized, over 75 per cent were immediately made non-commissioned officers after a few drills at camp, which is evidence that the training given the men is excellent. The commanding officer of the regiment is Colonel J. A. Freed, who was a captain in the Spanish-American War.

PHILIP J. THOMPSON,
Chairman, Military Affairs Committee, Youngstown Chamber of Commerce.

Merchants Close Their Stores Earlier

NEW BERN, N. C.—The merchants of New Bern, in addition to setting their clocks forward an hour on April 1, adopted a uniform and much earlier hour of closing their stores than formerly, namely, 6.30 P. M., excepting Saturdays. This is a great improvement over previous practices, and it seems to be the first time that the merchants have succeeded in getting together on any proposition. Previously the merchant closed his store when he thought the last customer he would get that day had walked out, so that the closing time ranged from 6.30 to 10 P. M. Patriotic inspiration had much to do with this revolutionary action, which was brought about by the Chamber of Commerce.

MANDEL SENER,
Secretary-Manager, New Bern Chamber of Commerce.

Lowering the Upkeep Cost of Municipal Motor Trucks

The standardization of the motor trucks in every department of the city's work offers a big advantage and money saving.

To do this, however, it is necessary to settle upon a truck which not only has the attributes of strength, reliability and low operating cost but also can be had in every size and form adapted to public work.

GMC is such a truck.

Whether for a light fast fire truck or ambulance or the heavy duty of road building and sewer construction, there is a GMC fitted by size, power and capacity to handle the work and handle it right.

Oversize in every part and overstrength give an ability far in excess of normal needs to every GMC, making them meet the emergency if one arises.

And moreover there is a reliability in a GMC truck fleet which is recognized by the adoption of GMC for municipal work in many towns and cities.

Let Your Next Truck be a GMC.

GENERAL MOTORS TRUCK COMPANY

One of the Units of the General Motors Corporation

New York Philadelphia Boston PONTIAC, MICH. **Chicago St. Louis San Francisco**

Distributors Most Everywhere (358)

The Johnstown Chamber's New Home

Johnstown, Pa.—The initial step in a program which has for its ultimate object the attainment of a real Chamber of Commerce building in Johnstown has been taken by the Johnstown Chamber of Commerce in leasing the seventh floor of the Fort Stanwix Hotel, exclusive of the sleeping apartments in the front wing of the building, for its new home. In these new quarters, which cover 4,200 square feet of floor space, the Chamber will be able to expand its work very materially and to introduce the luncheon feature. There has been an insistent demand among the members for quarters which would enable them to meet each other during the noon hour, or in the evening, to discuss matters of business, civic problems of the moment, war questions as they affect Johnstown and its people, and the many activities which engage the attention of the members at all times. The big dining-room, a view of which is herewith reproduced, affords an ideal place for the members to gather together, at luncheon especially, and discuss affairs without loss of time from their regular occupations. The dining-room was furnished by the hotel management, and is supplied with the same service as is offered in the main dining-room of the hotel. The leasing of the quarters in the Fort Stanwix Hotel makes the luncheon feature possible without imposing upon the organization the responsibility of maintaining an expensive culinary department. The lease states that no alcoholic liquors are to be served in the Chamber of Commerce headquarters, a rule in keeping with chamber of commerce practice thruout the United States.

The rooms include the beautiful lounge, which has been much admired, a reception hall in front of the elevator, two commodious office rooms, a smoking-room, a storeroom, and a lavatory. The dining-room can be easily converted into an assembly hall by moving the tables to one side. The comfortable telephone booths offer opportunities for confidential messages over the Chamber's private wires, and the Chamber's library provides a source of wide information.

A CORNER OF THE BIG DINING-ROOM OF THE JOHNSTOWN, PA., CHAMBER OF COMMERCE DURING LUNCH HOUR

Thus there have been made available to the 700 members of the Johnstown Chamber of Commerce the club features that form so important a part of the life of chambers of commerce in a number of other cities.

G. W. LEMON,
Secretary, Johnstown Chamber of Commerce.

The Trend of the Times—*Motorize*
The Motor Truck of the Times—
Garford

THE times demand action. Production has broken all bounds. Transportation bears the brunt.

It must hold up.

The highways must accommodate the overflow. The very life-blood of commerce pulses in these great arteries of progress.

And *you* are a part of this great scheme.

Your business is one of the vertebrae in the backbone of the nation.

Are you speeding it up? Are you putting the punch into production?

It is just as far from California to Maine as it is from New York to Paris. We could put the whole Western front into the State of Texas and have miles to spare.

Our very vastness calls for intensified transport.

The answer is *motorization*. And this means motor trucks in *your* business.

Then investigate the Garford Motor Trucks. They are economical, dependable, tenacious. Tried and proven through long years of staunch service.

Bought by business men on a business basis. Why wait and waste time?

Decide on Garford today. There is a Garford to fit your purpose.

Write us.

Garford MOTOR TRUCKS

The Garford Motor Truck Company, Lima, Ohio

Manufacturers of Motor Trucks of 1, 1½, 2, 3½, 5 and 6 ton capacity
4½, 7 and 10 ton Tractors
The Garford Road Builder

Hazleton's War Work

HAZLETON, PA.—The Third Liberty Loan campaign, like all the previous national campaigns that have been conducted in Hazleton, was managed by the Chamber of Commerce. A system was used which has proved very helpful in the past: two different colored cards were printed, one called the workers' card and the other the master card. They read as follows:

WORKERS' CARD

NAME .....
ADDRESS ..... WARD .....
CAPTAIN .....

Reports.

Subscribed to ..... Amount .....
Agency thru which subscribed:
Ward Business Bank
Refused to subscribe .....
This card must be returned to the Ward Captain after party named above has been interviewed.

MASTER CARD

NAME .....
ADDRESS ..... WARD .....
CAPTAIN .....

Reports.

Subscribed to Liberty Loan .....
" " Red Cross .....
" " Y. M. C. A. War Fund .....
" " Miscellaneous Campaigns .....

On the workers' cards were placed the names of the heads of all the families in the city. These cards were arranged according to streets, and the streets were grouped together by the wards in which they are located. As soon as the drive began, a map of the city which indicates every street and ward was sent to the ward captains. The captain distributed the cards, giving the names of the householders in his ward, among his workers, who visited those people. The method prevents a duplication of calls. If the person visited expressed a preference to subscribe thru his business, his bank or some other source, the worker made a note of that fact on his card. In such a case, a copy of the card was sent to the firm or bank referred to, and the person was appealed to from that quarter.

All the information which appeared on the workers' card was copied onto the master card. The master cards remain at all times in the files of the Chamber of Commerce office, and these furnish a complete record of the contributions to war charities by the people living in Hazleton. The Hazleton Chamber of Commerce has found that the most reliable list of residents is that kept by the Fire Department; the assessors' list contains the names of the owners of the property, but not of the present occupants in all cases. That the system works well may be judged from the fact that the allotment of Liberty Bond sales assigned to Hazleton was twice oversubscribed. Not a family is overlooked by this method.

The members of the Junior Chamber of Commerce have given very valuable assistance in these campaigns by copying the names from the registry of the Fire Department onto the cards. The Junior Chamber was organized about three months ago upon the suggestion of the American City Bureau, and ample proof has already been furnished of the wisdom of the suggestion. The services of these young people are being employed to further the interests of the organization, and, thru it, to serve the community, and the juniors are in this way receiving a very practical education in civics.

WALTER W. SCHULTZ,
Secretary, Hazleton Chamber of Commerce.

A Representative Board of Directors

PEORIA, ILL.—There are 101 faces in the photograph reproduced on page 567. Seventy of the gentlemen are members of the Board of Directors of the Peoria Association of Commerce; this board has 82 members altogether. The photograph was taken upon the occasion of a visit of the Board of Directors to the new steel plant of the Keystone Steel and Wire Company in Peoria, and the remaining 31 in the picture are officers and heads of departments of the Keystone Company who acted as guides on that visit.

Old and experienced secretaries of commercial organizations have commiserated the Executive Secretary of the Peoria Association of Commerce on the "unwieldiness" of a board of directors consisting of 82 members, but the plan has worked successfully in Peoria for seven years. Represented on this Board are approximately 46 local civic, industrial, commercial and educational organizations, each of which is entitled to one or two directors, according to the number of their members who are also members of the Peoria Association of Commerce. The other members of the Board

PACKARD TRUCKS

Repeat Orders Prove Packard Performance

Once a Packard owner, the municipality and the com mercial user alike continue to buy Packard trucks. Lon service brings out the best there is in them—proves thei dependability and essential economy.

In buying another Packard this spring, Edward N. Hines Chairman of the Wayne County (Michigan) Road Com mission, said:

> *"The fact that we again selected the Packard is the best evidence that we are perfectly satisfied with the truck, its performance, and the Company back of it."*

Packard trucks offer you the quality you want, the servic you need, and the stability that secures your investment.

Ask the man who owns one

PACKARD MOTOR CAR COMPANY, *Detroi*

are elected annually for terms of three years each; between ten and fifteen men are elected every year. The president of the Board selects an Executive Council from the Board of Directors. The Council meets at least fifty-two times a year and the Board of Directors at least twelve times.

At each of the directors' meetings there is an open forum for the discussion of local problems, when the needs of the city are brought to light. Decision in regard to undertaking specific work in an effort to solve these problems is left with the Executive Council. Vitally important matters are referred by the Executive Council, at its discretion, back to the Board of Directors for final decision.

SEVENTY OF THE 82 MEMBERS OF THE BOARD OF DIRECTORS OF THE PEORIA ASSOCIATION OF COMMERCE APPEAR IN THIS PHOTOGRAPH, IN WHICH THERE ARE 101 FACES ALTOGETHER

The record shows an attendance of from sixty to eighty per cent of the members, which answers the question as to whether the directors are faithful in their attendance at the meetings. An analysis of the reason for absence has shown that the absentees were either out of the city, under a doctor's care or detained by unusual business engagements. In short, a board of directors of eighty-two has not proved unwieldy, and the plan has contributed materially to the splendid spirit of the Association and the city.

WILLIS EVANS,
Executive Secretary, Peoria Association of Commerce.

Farmer Memberships Secured

Dublin, Ga.—The Chamber of Commerce of Dublin and Laurens County has digressed a little this year from its regular method of securing new members. It has previously solicited only the business men of the town for memberships, but some of the officers believed that this year it might be possible to interest the farmers living in the community in taking out memberships in the organization. The section is almost entirely an agricultural one, and the majority of the Chamber's work for the last five years has been done in the rural districts in the interest of agriculture, altho the farmers were not members of the organization.

A farmers' membership fee of $5 was established, which is half the regular fee, and dinners were given for the farmers free of charge in the best hotel in Dublin on every Saturday for six weeks, at which the work of the Chamber of Commerce was explained. This propaganda resulted in the Chamber's securing about 95 per cent of the farmers who attended the dinners as members for 1918. Now that the farmers are actually connected with the organization, they will naturally give it their support.

N. G. BARTLETT,
Secretary-Manager, Dublin and Laurens County Chamber of Commerce.

Salesmanship Introduced into the Public Schools of Jersey City

Jersey City, N. J.—In keeping with its reputation for providing the last word in vocational training for its boys and girls, the Board of Education of Jersey City, in adopting its 1918-1919 budget, has made provision for a lecture course on Salesmanship to be given in the Evening High Schools. It is more than probable that

A Transportation "Giant"

THE full value of the motor truck is now being universally felt. From bridging the gaps of transportation due to unusual demands on railroads, it has established itself as an organized system of distribution, running from city to city on definite schedule. Since the builders of

Firestone Tires

originated this Giant truck tire, three years ago, there has been practically no restrictions to motor transportation. Equipped with these massive tires, *with the grooved treads,* trucks easily get through snow, mud and over ice. This great bulk of resilient rubber in one body, grooved to give play and grip, accounts for the remarkable traction of this tire, the fuel it saves, the unusual protection it affords the truck, and the net results of Most Miles per Dollar. Sizes: 8, 10, 12 and 14 inch widths for medium and heavy duty. There are many other types of Firestone Truck Tires, one for every load, road and condition. Consult the Firestone man.

FIRESTONE TIRE AND RUBBER COMPANY
FIRESTONE PARK AKRON, OHIO
BRANCHES AND DEALERS EVERYWHERE

before the schools reopen next September, some provision will have been made for including this very interesting subject as a part of the regular commercial course curriculum in the day schools also.

Back of this progressive step towards better merchandising in Jersey City is an interesting story of coöperative effort for community service on the part of the Retail Board of the Jersey City Chamber of Commerce. From a retail merchandising standpoint, Jersey City has suffered because of New York's easy accessibility, and last fall its retail merchants came to the conclusion that the only solution of their problem rested in the installation of salespeople behind their counters possessing a knowledge of scientific salesmanship. At that time, trained salespeople were nearly as hard to find in Jersey City as the proverbial needle in the haystack, and the merchants realized that the only way in which a better quality of service could be obtained would be to inaugurate a comprehensive course of training for their own salespeople. The Board of Education was appealed to, but its members refused to believe that there was any real need for such instruction aside from the selfish interests of the retail merchants, and the only way in which they were willing to coöperate was to donate the use of a room in the High School building in which to hold the school sessions.

The Chamber of Commerce, thru its Retail Board, then stepped into the breach and organized Jersey City's first School of Salesmanship. An instructor was secured and a ten-weeks' lecture course was mapped out. A circular letter was mailed to all of the retail merchants in the city asking their coöperation to the extent of encouraging their employes to attend the lectures, which were held every Thursday evening; the general public was invited to attend the lectures thru the columns of the daily newspapers.

The salesmanship class was a success from the start. At the opening lecture the class room was crowded to overflowing, and the attendance stood at capacity figures right thru the course. Students who attended at least seven out of the ten lectures and kept note books were given the privilege of taking a written examination at the end of the course; those attaining a passing mark of 75 per cent or better were awarded diplomas by the Chamber of Commerce. During the winter 359 students were enrolled in the salesmanship class and 152 qualified for the final examination.

The salesmanship class was loyally supported by the retail merchants, many of whom offered prizes to those of their employes who would qualify for diplomas. Prizes were also offered for the best compositions on the subject "What I Learned in the School of Salesmanship Course," and some really remarkable papers were submitted.

The enthusiasm among the members of the class was kept at a high pitch thruout the entire course. During the Liberty Loan campaign, the local Liberty Loan Committee appealed to the class members to put their training to a practical test by selling Liberty Loan bonds, and a quota of $50,000 was fixed for the students. The embryo salespeople responded to the challenge with a will and went over the top 112 per cent by selling $112,700 worth of bonds in a little more than a week's time.

As the closing feature of the Salesmanship School, graduating exercises were held in the auditorium of the High School. A volunteer committee from the class arranged an interesting program, which included a one-act sketch in which some of the many lessons learned during the lecture course were well illustrated. More than 1,800 retail merchants and their friends were present.

The Superintendent of Education presented the diplomas, and the members of the Board of Education were among the invited guests. After the graduating exercises were completed, the Chamber of Commerce presented a resolution calling upon the Board of Education to include salesmanship in its regular high school curriculum, and the request was backed by a petition signed by more than one hundred members of the class. In the face of this very clearly demonstrated demand, the Board promptly capitulated, and now Jersey City's public is to reap the benefit of the Chamber's effort thru better service in the stores; moreover, the retail merchant is assured a continually renewed crop of experienced salespeople from which to recruit his working forces.

In the Service

FULLY two thousand pieces of American-La France motor fire apparatus are in fire departments throughout the country. Ready at the tap of the gong—on duty to do their part toward keeping the wheels of our war industries turning—in our country's service.

It is extremely significant that there is more American-La France motor fire apparatus in service than all other advertised makes combined.

This is not due to chance. It is the logical result of producing motor fire apparatus famous for

Reliability *Dependability* *Efficiency*

Utica, N. Y., Fire Department. Equipped with American-La France Motor Fire Apparatus

AMERICAN-LAFRANCE FIRE ENGINE COMPANY, INC.

Elmira, New York, U. S. A.

Member of the National Automobile Chamber of Commerce. Licensed under the Dyer Patents

Branch Sales Offices and Service Stations

New York Boston Chicago San Francisco Portland, Ore. Dallas
Los Angeles Atlanta Denver Pittsburgh Baltimore Minneapolis

CANADIAN FACTORY, TORONTO, ONT.

What Jersey City has accomplished is within the grasp of any live, energetic community which harbors a real desire to improve its retail merchandising conditions, and the Jersey City Chamber of Commerce will be very glad to furnish any additional information relative to the way in which it conducted its most successful School of Salesmanship class.

WILLARD G. STANTON,
Publicity Department, Jersey City Chamber of Commerce.

Intensive Americanization Work

Bethlehem, Pa.—So serious is the alien problem in Bethlehem that the newly organized Chamber of Commerce of that city has taken up the problem of Americanization upon which to exercise its first constructive efforts. An Americanization Bureau has been formed within the Chamber, with George T. Fonda, head of the Safety and Welfare Department of the Bethlehem Steel Company, as Chairman. Professor Julian Korski Grove, an American citizen of Polish birth who has been active in naturalization work for the past ten years and who has just finished an exhaustive study for the Government Bureau of Education under the title of "The Assimilation of the Immigrant," has been employed to direct a systematic campaign looking to the education, Americanization and naturalization of Bethlehem's foreign-born population.

One-third of the workers in the industries of Bethlehem are aliens. The Bethlehem Steel Company alone has 10,266 aliens on its pay-roll. An industrial survey just completed shows that of this number 10.3 per cent have taken out their first papers, 25.1 per cent desire to become American citizens, while 55.4 per cent are actively antagonistic to the idea of American citizenship. This last percentage indicates the extent and strength of the enemy propaganda that must be overcome.

The Americanizing of the industrial workers of Bethlehem is a big task to contemplate, but one more important from a community, industrial and national viewpoint cannot be imagined. The industries of Bethlehem have indicated their interest by contributing $5,000 per year, in addition to the amount regularly given to the Chamber of Commerce by them, to assist in this work, to which the Chamber expects to devote its best efforts for a number of years. The Government, too, has promised its aid thru the Division of Immigrant Education of the Bureau of Education.

The efforts will be directed, not to making a showing in the number of first papers taken out, but to inculcating in the mind of the alien thru work in the home, the school and the factory a real knowledge of the fundamental advantages of American citizenship, so that the desire for citizenship shall spring from within and not be the result solely of pressure from without.

IRVING C. NORWOOD,
General Secretary, Bethlehem Chamber of Commerce.

New Bulletins

Hoquiam, Wash.—*Activities,* published monthly by the Hoquiam Commercial Club.

New Bedford, Mass.—*New Bedford,* the official bulletin of the New Bedford Board of Commerce.

Recently Issued Printed Matter

Dubuque, Iowa.—"Dubuque, Iowa, on the Mississippi" is the name of a booklet recently issued by the Publicity Committee of the Dubuque Commercial Club. The story it contains, entitled "Why I Like My Town Best," is the story which won the first prize in the contest "Why I Like My Part of the Country Best," which was conducted by the *American Magazine,* where it was published in condensed form. A folder entitled "Statistical Facts of Dubuque, Iowa," has also been issued recently by the Dubuque Commercial Club.

New York City.—"The Bronx, New York City's Fastest Growing Borough," a pamphlet published by the Bronx Board of Trade.

New York City.—A summary of the year's work of the Chamber of Commerce of the Borough of Queens, as well as of the previous seven years since the Chamber was organized, is contained in the April number of *Queensborough,* the Chamber's monthly bulletin.

Plymouth, Mass.—A pamphlet containing the Annual Reports of Standing Committees for 1917 of the Plymouth Chamber of Commerce.

St. Louis, Mo.—A pamphlet entitled "What Does the Chamber of Commerce Do?" issued by the St. Louis Chamber of Commerce.

San Luis Obispo, Cal.—"Results, by the San Luis Obispo Chamber of Commerce," is the title of a semi-annual bulletin issued by the Chamber of Commerce of San Luis Obispo on April 4, 1918.

Tacoma, Wash.—"Tacoma, Military City of the Pacific Coast," is the title of a folder issued by the Tacoma Commercial Club and the Tacoma Chamber of Commerce.

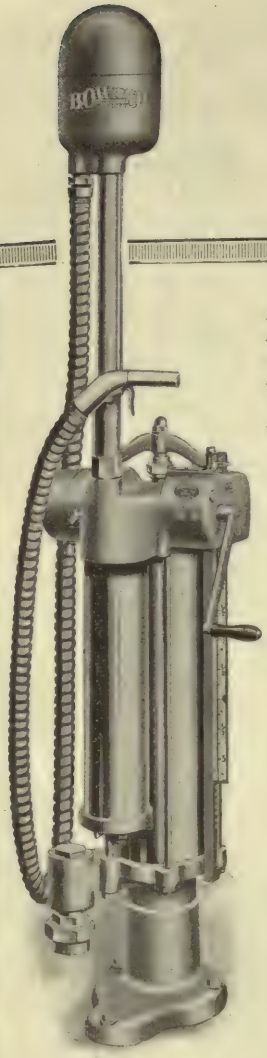


Fig. 101—A Five Gallon Indoor Gasoline Pump.

BOWSER ESTABLISHED 1885

City Protection

is made possible by Bowser Storage Systems for gasoline and oil. Garages, homes, factories, stores, public buildings, and oil companies are all safe from this volatile liquid when they employ Bowser for storing facilities.

Over one million systems in use today—giving satisfaction year after year.

Illustration shows Fig. 101, a 5 gallon indoor gasoline pump—the fastest operating pump on the market. Also Fig. 64, a Two unit lubricating oil system designed to eliminate losses and hazards of all kinds.

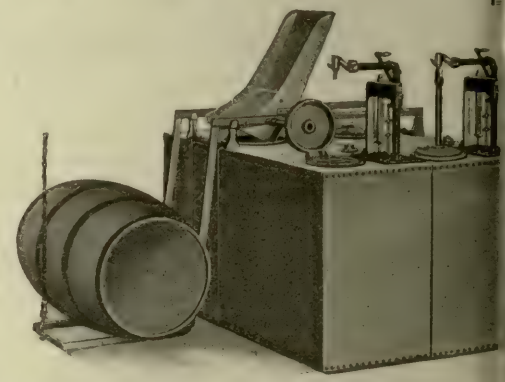
Write for Booklet No. 5.

S. F. Bowser & Co., Inc.

Fort Wayne, Indiana

U. S. A.

Fig. 64—Two Unit Storage System for Lubricating Oil.



Changes among the Secretaries

A LIST of the recent changes and new appointments occurring among the secretaries of the commercial organizations thruout the United States is now being published in THE AMERICAN CITY. Will readers kindly notify the Editors of such changes as soon as they occur, in order that the list may be made as complete as possible each month?

Frank Albus has been elected secretary of the Evansville, Ind., Chamber of Commerce, to succeed Robert T. Bonham.

George H. Anderson has been elected secretary of the Elgin, Ill., Commercial Club, to succeed F. H. Wyatt, who has joined the staff of the City Development Bureau.

T. J. Appleyard has resigned the secretaryship of the Piqua, Ohio, Chamber of Commerce, to become secretary of the Newark, Ohio, Chamber of Commerce.

Miles E. Bramlee is now serving as secretary of the Winchester, Va., Chamber of Commerce, having resigned the secretaryship of the Olean, N. Y., Business Men's Association.

Benjamin J. Brown has been selected as the secretary for the new Lake County Chamber of Commerce at Painesville, Ohio. Mr. Brown formerly held the secretaryship of the Chamber of Commerce at Winchester, Ind.

Fred Clayton Butler has secured leave of absence from the secretaryship of the Tonawanda, N. Y., Chamber of Commerce to take charge of the Community Organization Branch, Industrial Service Section, Ordnance Department, Washington, D. C. Mr. Butler's successor as acting secretary at Tonawanda is Charles W. Ward.

Richard R. Coley, formerly a newspaper man on the staff of the *Buffalo Evening News*, has been chosen to fill the vacancy in the Batavia, N. Y., secretaryship caused by the death of M. L. Dennis.

Lawrence H. Duncan, formerly secretary of the Bluefield, W. Va., Chamber of Commerce, has accepted the secretaryship of the Rocky Mount, N. C., Chamber of Commerce.

C. F. Dunn has resigned the secretaryship of the Frankfort, Ky., Chamber of Commerce, to accept the secretaryship of the Lexington, Ky., Board of Commerce.

J. F. Ermatinger has resigned as secretary of the Fond du Lac, Wis., Association of Commerce, to accept the secretaryship of the Glendive, Mont., Chamber of Commerce.

Alfred Jenkins has resigned the secretaryship of the Carlisle, Pa., Chamber of Commerce, to accept the secretaryship of the Poughkeepsie, N. Y., Chamber of Commerce. The assistant secretary, M. C. Bunyan, has been appointed secretary at Carlisle.

Fred A. La Belle has been elected secretary of the Youngstown, Ohio, Chamber of Commerce, succeeding Robert Wadsworth, who has resigned to take up Red Cross work in France.

Frank B. Lamson has been chosen secretary of the newly organized Marshfield, Wis., Chamber of Commerce. Mr. Lamson was formerly secretary of the Bemidji, Minn., Commercial Club.

R. M. McClure has resigned the secretaryship of the Marion, Ohio, Chamber of Commerce, to accept the secretaryship of the Mansfield, Ohio, Chamber of Commerce.

George H. Mosser has been elected managing director of the Trenton, N. J., Chamber of Commerce.

Forbes Parkhill, formerly assistant secretary of the El Paso, Texas, Chamber of Commerce, has been elected secretary of the Deming, New Mexico, Chamber of Commerce.

Frank C. Russell has recently been elected secretary of the Riverside, Cal., Chamber of Commerce.

Colonel C. A. Simmons has resigned the secretaryship of the Poughkeepsie, N. Y., Chamber of Commerce, to accept a position on the field staff of the American City Bureau. He is succeeded by Alfred Jenkins, of Carlisle, Pa.

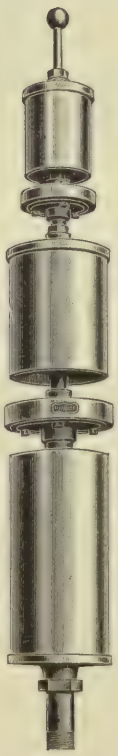
Paul B. Smith, formerly secretary of the traffic and rating bureau of the Ardmore, Okla., Chamber of Commerce, has been chosen as the new secretary of the Chamber of Commerce, succeeding James Glenn.

Charles F. Troy has been appointed secretary of the McAlester, Okla., Commercial Club, succeeding J. L. Shinaberger.

Carl W. Ullman has accepted the secretaryship of the Richmond, Ind., Commercial Club, succeeding Frank Albus.

Roland B. Woodward has resigned his position as secretary of the Rochester, N. Y., Chamber of Commerce, to accept a position as assistant to the president of the Symington Companies of Chicago. The first assistant secretary, A. Edwin Crockett, has been appointed as acting secretary of the Rochester Chamber of Commerce.

WORCESTER FIRE ALARM SIGNALS



are heard above the din of the workshop and the rattle of the streets.

They are different from ordinary steam whistles and produce an immense volume of sound which, while soft and pleasing near by, extends over an incredibly large range. We have authentic reports of the gongs having been heard over distances of more than twenty miles.

Blown by steam and operated either by hand or electrical control.

Among the four sizes there is one that exactly meets the needs of your town.

Write us for catalog

UNION WATER METER COMPANY

35 HERMON STREET WORCESTER, MASS.

Restoring the Efficiency of Clogged Water Mains*

By Burt B. Hodgman

THE cleaning of water mains has as its object the restoring of lost carrying capacity and the removal of all dirt, filth and bacteria hiding-places from the mains. This mechanical cleaning or scraping has been practiced in this country for approximately fifteen years. There are two general conditions which call for this work, the first being reduced carrying capacity of the main or conduit, and the second, the accumulation of mud, slime and filth.

DISCHARGE OF DIRT DURING THE CLEANING OF A 20-INCH PIPE IN ST. LOUIS, MO.

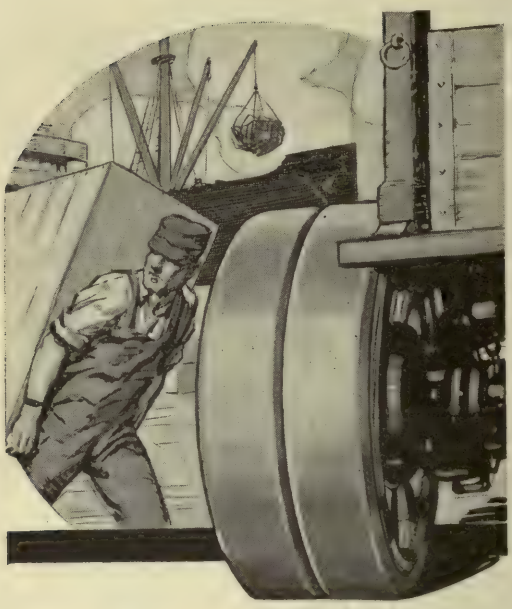
Causes of Reduced Carrying Capacity

The principal cause of reduced carrying capacity is the rough interior surface of the pipe, which is brought about either by a deposit of some description or by the growth of scale due to galvanic or chemical action in the mains. Free carbonic acid gas in the water will almost always cause a growth of iron rust, which is sometimes called tubercular; this form of scale is readily recognized by the superintendent as a carbuncle or wart on the surface of the iron. Those of us who have cut into old mains are well acquainted with this class of scale, which is easily removed.

There are other forms of growth, such as pipe moss and pipe sponge. These particular growths are more usually found as a result of surface waters which are inclined to be soft, but we also get them from ground water where crenothrix is present. Often the trouble is due strictly to deposit or sedimentation, which is prevalent in water systems where turbid waters have been pumped for years, and also in some very hard waters where lime scale forms, and in plants where an excess of lime has been used as a coagulant. The lime scales are more common in the Western Plains states. Mud and clay deposits are found in every part of the United States and are usually discovered in the bottom of the pipe; in several instances mud and clay have been found to more than half fill the mains.

AFTER THE MACHINE (SHOWN ON STREET AT LEFT) HAD PASSED THRU THE CLOGGED MAIN SHOWN ABOVE

* From a paper read at the recent annual convention of the Southwestern Water Works Association, held in Tulsa, Okla.



United States Truck Tires

Are Good Tires

A tire to fit every particular condition of your transportation needs.

Profit by the good judgment of thousands of satisfied users.

Redeem Your Cracked Fire Hose

We can take out the inner jacket and lining and draw into the outside jacket a single hose lined with

BI-LATERAL CONSTRUCTION

Your old couplings can be used and it will save you approximately 40c. per foot.

Write for further information

BI-LATERAL FIRE HOSE CO.
326 W. Madison Street Chicago, Ill.

Dayton Airless Tires

GUARANTEED 2½ YEARS

Made exclusively for Fire Department use.

Ride like Pneumatics
No Punctures
No Blowouts

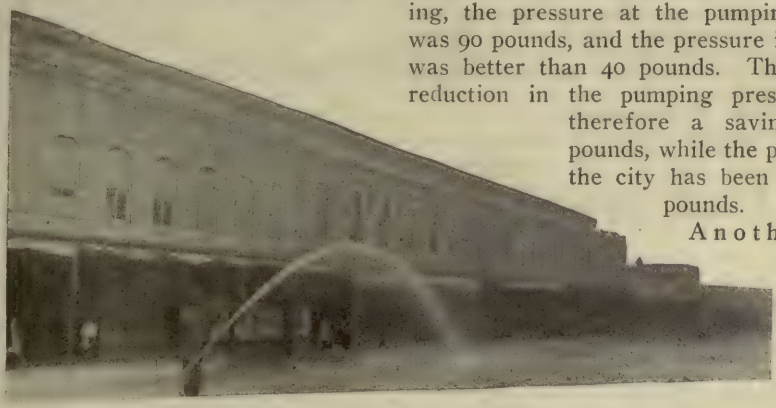
Write for information

The Dayton Rubber Mfg. Co
Dayton, Ohio

This is particularly true in the larger mains where the velocity is not, and cannot be, as high as it is in the smaller mains. Clay forms in two different ways, sometimes, as has been said, in the bottom of the pipe, and sometimes concentrically.

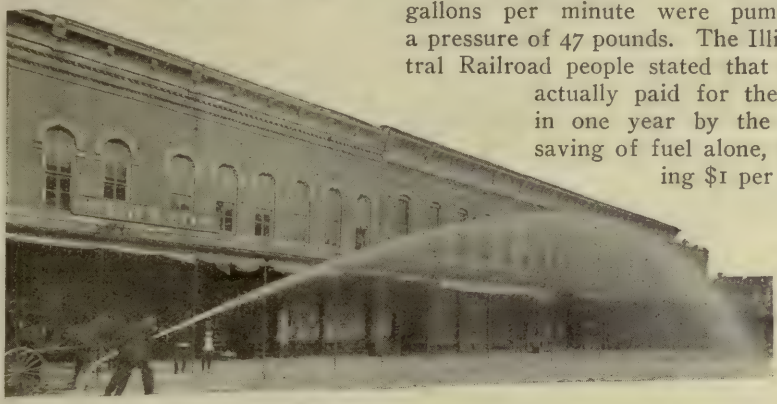
The effect of scale or corrosion on the carrying capacity of a main is exceedingly large. An example of the lost carrying capacity due to rough surface is well illustrated by the riveted steel pipe, the rivet heads and junction of plates causing a roughness which reduces the carrying capacity of that class of pipe from 15 to 20 per cent below that of new cast iron pipe of the same diameter. But this reduction in carrying capacity is small as compared to that of cast iron which has been allowed to become heavily incrusted without being scraped. The friction is often four to five times what it would be after scraping.

A good example of this condition was a 24-inch main, 11 miles long, which had a very small growth of scale, the individual tubercles being not more than ⅜-inch in thickness, and most of the growth being on the bottom of the pipe. The pumping pressure before cleaning this main was 125 pounds, while the pressure in the city averaged only about 30 pounds. After cleaning, the pressure at the pumping station was 90 pounds, and the pressure in the city was better than 40 pounds. This gave a reduction in the pumping pressure, and therefore a saving of 35 pounds, while the pressure in the city has been raised 10 pounds.



FIRE STREAM BEFORE CLEANING MAINS, MT. VERNON, ILL.

Another case which was even more pronounced was that of an 8-inch pipe cleaned for the Illinois Central Railroad. This pipe was 2 miles in length, and the pumping pressure to force 407 gallons per minute to the tank was 140 pounds. After cleaning, 415 gallons per minute were pumped with a pressure of 47 pounds. The Illinois Central Railroad people stated that they had actually paid for the cleaning in one year by the resulting saving of fuel alone, coal costing $1 per ton.



FIRE STREAM AFTER THE MAINS IN MT. VERNON WERE CLEANED

Effect Upon Public Safety and Health

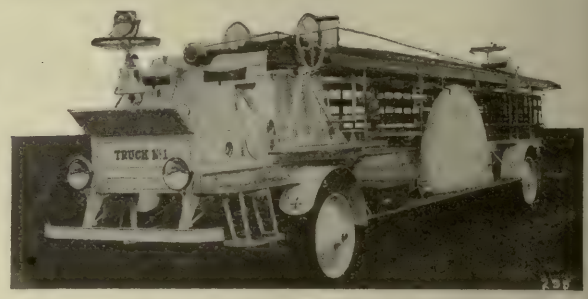
One of the most common results of reduced carrying capacity is the loss in fire protection to the city where these troubles are found. One quarter of an inch of scale in a 6-inch pipe will reduce probably by 50 per cent the effective fire-fighting efficiency of that section of the city fed by

Four-Wheel Drive
Aerial Ladder Truck

Pneumatic Air Hoist
Automatic Ladder Lock

One man puts the ladders where you want them. **No More Cranking.**

Write for free booklet and list of users



COUPLE-GEAR FREIGHT-WHEEL CO., 525 Buchanan Ave., GRAND RAPIDS, MICH.

IS A LIFE WORTH $39.70 IN YOUR TOWN?

Every city but one in Iowa over 5,000 population has Lungmotor protection—for protection in cases of

Gas Asphyxiation,
Drowning,
Electric Shock,
Asphyxia at Birth,
Etc.

Total cost of Lungmotors $3,375—lives saved to dat 83—cost each life saved $39.70.

Remember every additional life saved, this cost is reduced.

What is it worth to save lives in your town?

Send for full information

LIFE SAVING DEVICES CO., 564 1-2 W. Monroe St., CHICAGO, ILLINOIS

Loper Fire Alarm Co.

STONINGTON, CONN.

Manufacturers of

Compressed Air Fire Whistles
Whistle Blowers
Bell Strikers, Boxes, Gongs
Etc., Etc.

Estimates Cheerfully Given

The Anderson Coupling & Fire Supply Company

KANSAS CITY, KANSAS

Manufacturers of

MOTOR FIRE APPARATUS
General Fire Department Supplies
Anderson-Hale Fire Station Door Openers

Estimates Cheerfully Given

THE GAMEWELL FIRE ALARM TELEGRAPH CO.

"Registered U. S. Patent Office"

Manufacturers of
Fire Alarm and Police Signal
TELEGRAPHS
for
Municipalities and Private Parties

The Gamewell system of to-day is the outcome of the combined inventive genius and mechanical skill of many whose valuable services the company has been able to secure during the past fifty-seven years, in pursuance of its policy of meeting at any cost the requirements of the varied conditions existing in different localities.

Correspondence Solicited.

General Office and Works:
Newton Upper Falls, Mass.

the line, and a heavier scale affects it very much more more seriously. In a certain city where pipe-cleaning work was undertaken, prior to the cleaning of the mains the city was served with the pink slip by the Board of Fire Underwriters, which meant that the city was to have an increase of 25 per cent in its premium, unless conditions were corrected. After the cleaning, the Board of Fire Underwriters made another examination, and the rates were not raised at all. In the city of Cincinnati, Ohio, in 1909 or 1910, the Board of Fire Underwriters made a complete survey and recommended many changes. The mains in all of the heavy risk districts were then cleaned, and in 1915, with practically no other changes, another examination by the same Board gave them a clean bill of health.

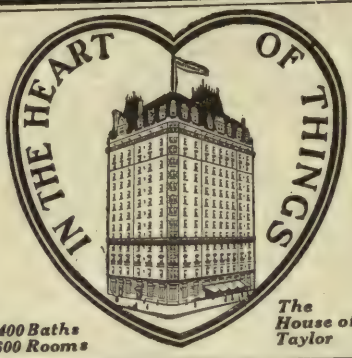
It is hardly necessary to consider at length the subject of removing filth and bacteria-filled mud from a system where a filtration plant has been installed. This is a self-evident duty, and the officials who refuse to consider it are laying themselves open to serious criticism, for much of the value of the filtration plant may be seriously impaired and a very large expenditure neutralized for some time by the failure to take the necessary precaution of cleaning.

How the Cleaning is Done

The method of cleaning water mains is purely a mechanical scraping accompanied by thoro flushing. The processes take place simultaneously, the water passing thru the cleaning machine at all times during its operation and forcing all cleanings out ahead of the machine itself. There are several different kinds of cleaning machines used, the particular type depending upon the nature of the scale or deposit to be removed. In very hard deposits, it is necessary to use a turbine machine, which grinds out the deposit. In the case of iron rust, sponge, mud and others of the soft deposits, a straight scraping machine which has several heads is used, these heads carrying cutting and scraping blades.

In small mains, it is usually necessary to force a cable thru a section of main to be cleaned, this section being from 500 to 1,500 feet in length, attach a cleaning machine to the cable, make up the pipe permanently with a piece of new pipe and sleeve where the machine has been entered, turn on the water back of the machine and pull the machine thru with this cable, taking the machine and scrapings out thru a riser pipe at the other end. In larger pipes, those from 10 inches to 36 inches in diameter, the machine is pulled into a new piece of pipe, and this section of pipe is cut into a main at the starting point, a 45° bend and riser pipe are put temporarily at the other end of the section to be cleaned; the pressure is turned on behind the cleaning machine, and it is forced thru by the pressure itself. A certain amount of wash water is allowed to pass thru openings in the piston, so that the cleanings are again always kept ahead of the machine and come thru a riser.

The cleaning of water mains by modern methods results in the restoration of a smooth inner surface and the original diameter of the pipe, and a guarantee is made that the carrying capacity will be restored to within 5 per cent of that of new pipe of the same diameter, and laid under similar conditions. This 5 per cent allowance is not for any dirt or scale left in the pipe, but is only to cover the irregularities in laying, as the tables given are made out for theoretically perfectly laid pipe. There is but one alternative to cleaning mains which are in bad shape on account of corrosion or sedimentation, and that alternative is to lay new mains. We do not buy new dishes or new shirts because the old ones are dirty, nor do we keep on using them when they are dirty. Cast iron water mains do not wear out, but lose their efficiency, and it can be entirely restored.



400 Baths
600 Rooms

The House of Taylor

HOTEL MARTINIQUE Broadway, 32d St. NEW YORK, N.Y.

One Block from Pennsylvania Station.

Equally Convenient for Amusements, Shopping or Business

Pleasant Rooms, with Private Bath, **$2.50** per day

257 Excellent Rooms, with Private Bath, facing street, southern exposure, **$3.00** per day

Also Attractive Rooms from $1.50.
The Restaurant Prices Are Most Moderate

PAINT THAT ROOF

Protect the roofs of all your buildings from the elements by painting them with "Pioneer Rubber Coat." It furnishes a tough pliable, rubber-like coating to the roof and will "hold tight" in all kinds of weather.

Write for descriptive matter

The Pioneer Asphalt Co.
7323 Woodlawn Ave. Chicago, Ill.

FABRIC FIRE HOSE

is of an unusually careful manufacture
WAX and PARA GUM TREATED

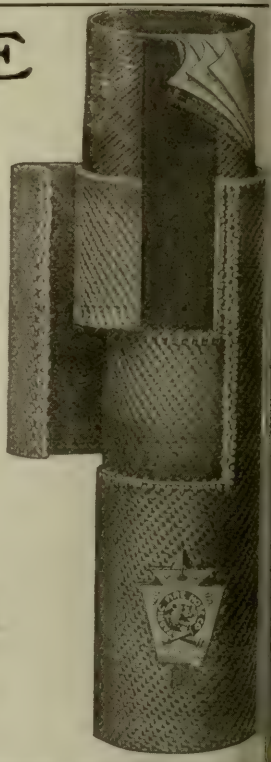
The lining is of fine Para Gum, hand made, four calendered, smooth bore or lap-jointed

Circular balance woven, each strand of cotton is treated to a bath of melted Wax and Para Gum, then cabled and woven into the jackets.

Absolutely waterproof, making the ideal hose for fire departments.

Treatment lubricates and solidifies the strands of cotton, assuring long wear.

Made in all sizes from 1 to 6 inches inside diameter.



FABRIC FIRE HOSE CO.
COR. DUANE & CHURCH STS., NEW YORK

Branch Offices

CHICAGO
ATLANTA
COLUMBUS, O.
MINNEAPOLIS
OKLAHOMA CITY
PORTLAND, ORE.
SAN FRANCISCO
BALTIMORE, MD.
ELMIRA, N. Y.
BINGHAMTON, N. Y.
PITTSBURGH
NEWARK, N. J.
MONTREAL
PROVIDENCE
DALLAS, TEX.

Patentee and Sole Manufacturer

After-War Problems of Reconstruction

Resolutions Adopted by the National Convention of the American City Planning Institute at St. Louis, Mo., May 29, 1918

Whereas, it is evident that when the war is over, many problems of readjustment will need to be solved; and

Whereas, the British Government, foreseeing similar difficulties, has appointed a Ministry of Reconstruction; be it

Resolved, that the American City Planning Institute, in convention assembled, urge upon the President of the United States the early consideration of such questions and the appointment of some official body to deal with the matter.

Whereas, changed industrial conditions after the war may necessitate the starting of vast public works, and such improvements require time for maturing adequate plans, be it

Resolved, that the American City Planning Institute urges on the Governors of the various states and the Mayors of the various cities that the planning of such work be undertaken at this time.

"A Dangerous Year in Which to Be a Boy"

By Henry S. Curtis

IN many cities thruout the country there is a demand for economy during the war, and ofttimes it is the play facilities which are selected for elimination.

This is a serious mistake. There never was a time when there was a greater need that our young men should be in perfect physical condition. About one-third of those of draft age are being rejected as physically unfit, while probably fully half the time of training those who are not rejected is devoted to getting the men into physical condition to enable them to serve efficiently.

During the last two years the states of New York, Rhode Island, New Jersey, and California have passed laws making a definite requirement of play and physical training for all school children. This has been done in the main as a war measure, and there never was a time when there was greater need to furnish every manner of facility of this sort than at present. We must remember, also, that the Grim Reaper will garner in many of those whom we are sending to France, and that we must take good care of the youths who will take their places in the years which are to come.

It may be well to consider, also, that in all these years in which play and physical training have been officially promoted in Germany, it has always been primarily for military reasons. There has been scarcely an issue, I suppose, of "Korper und Geist," or the "Jahrbuch für Volks-und-Jugendspiele" for the last twenty years which has not contained some statement to the effect that a great war is impending and it is the patriotic duty of every German to take exercise and keep himself in condition to serve. We justly condemn this ideal and purpose, but it should help us to realize that this is no time to drop the appropriation for children's playgrounds.

Let us remember also that thruout Europe there has been an increase in juvenile delinquency ranging from 30 per cent to 60 per cent since the beginning of the war, and recent statistics from Massachusetts indicate an increase of 50 per cent in delinquency in the Bay State during the past year. The year 1918 is the most dangerous year in which to be a boy there has ever been in the history of America, and every provision that can be made to safeguard our youth is an absolute social necessity.

SIGNS

All kinds of durable and ornamental signs.

Street Names, *Catalog B*
Road Direction
Park
Warning } *Catalog C*
Traffic, *Catalog D*

Catalogs illustrated in colors, send for any one or all of them.

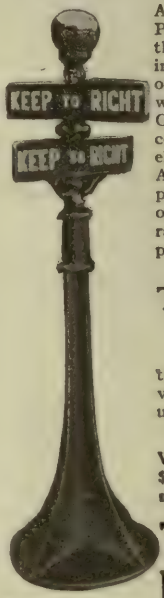
JOSEPH N. EARLY
Est. 1861
Patentee and Manufacturer
320 Broadway :: New York

King Poles and G. E. tops make the best lighted streets

Send for our beautifully illustrated booklet—free. Send name and address today.

KING FOUNDRY CO.
55 W. Jackson Blvd.
Chicago, Ill.

The Leb-Iron Traffic Sign



Wt. of Base, 150 lbs.
Total Wt., 225 lbs.

A Substantial, Efficient, Silent Policeman. The words "Keep-to-the-Right" are in 2½ and 1½ inch letters, rounded and stand out a half-inch from the boards, which are covered with Red or Green smalts as desired. The covering is carefully baked in electric ovens, insuring long life. A 7-inch Red or Green Globe is placed on the top, which is about on the level with the chauffeur's range of vision. It cannot be passed unnoticed.

The Base Weighs 150 Pounds

the complete sign, 225 lbs. Provision is made for wiring from underneath or overhead.

Price complete, including Wiring Lamps and Fixtures, $20; plain, with provision for attaching Lantern, $16.

The Lebanon Machine Co.
Lebanon, N. H.

EVERY DAY PROVES

the country must depend upon its highways for freight. Let's mark them with good direction signs—our kinds—Helps the man driving a car and it "boosts" your town.

MATHEWS Direction Street Traffic **SIGNS**

White Plains, N. Y.

Street Signs Road Guide Posts Traffic Signs

The Kind That Last

Made of Heavy Galvanized Iron with letters sunken into plate.

If you are looking for *permanent* signs instead of the short lived ordinary variety write to us for prices, illustrations and further particulars.

Union Iron Products Co.
Drawer H-2 E. CHICAGO, IND.

BEST PAVING BRICK MADE

THE METROPOLITAN PAVING BRICK COMPANY
"THE WORLD'S LARGEST"
CANTON, OHIO

PHILLIPS UNIVERSITY LIB

New Land Legislation Urgently Needed

A Proposition to Penalize the Agricultural Slacker

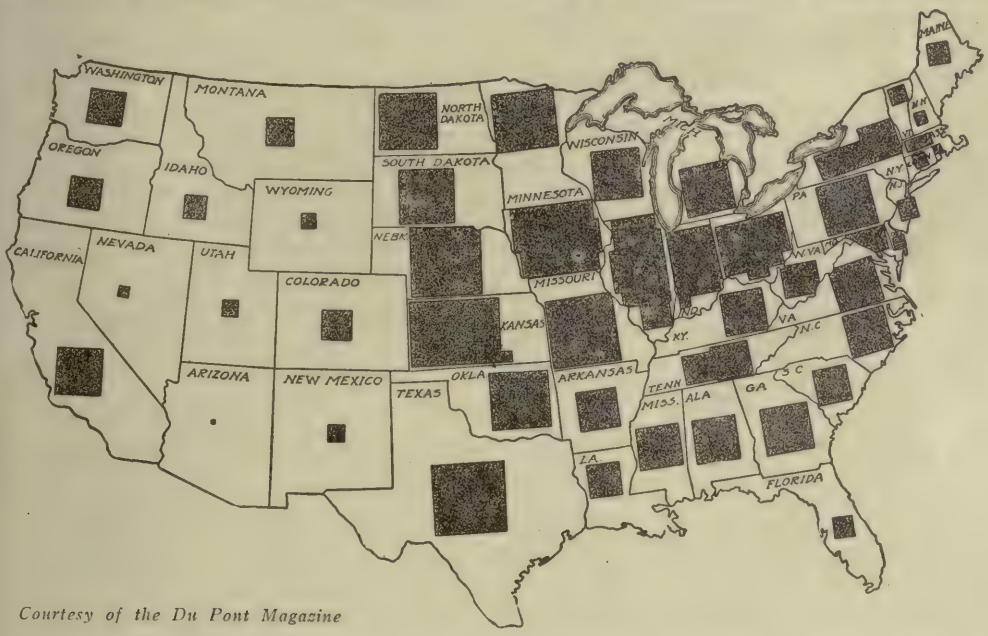
IN the March issue of *The Common Good,* Governor Charles S. Whitman of New York is quoted as having spoken at a recent meeting of the New York State Agricultural Society as follows:

"Another very wise policy which has been followed abroad is a plan of exempting certain holdings from taxation. This has proved a conspicuous success, and perhaps some plan of this kind would work well with us.

"It has been proposed, for instance, to exempt from taxation all the man-made improvements of farm land, the orchards and woodlands, the fences, the buildings, the flocks, herds and machinery, levying our rural taxes only on the bare land values, always provided that the land is adequately worked.

"Such a policy would of necessity result in taxes being slightly higher on bare and idle land, but to the enterprising working farmer it would mean a substantial reduction in his taxes; for any slight increase which he might pay on his land would be more than offset by exempting his buildings and his personal property.

"It would certainly seem wiser to penalize the agricultural slacker who leaves his land idle and unworked than to discourage the real farmer, the farmer who is rising to his responsibilities and doing his share to feed the nation, by penalizing him thru the tax tolls for every movement which he makes, every sign of prosperity which he shows, every contribution which he makes to meet the national emergency with which we are now confronted."



Courtesy of the Du Pont Magazine

THE SHADED AREAS INDICATE THE ACTUAL AMOUNT OF IMPROVED LAND IN THE UNITED STATES

✣ ✣

Wanted: A Land Policy!

In the Women's War Work Number of the New York *Evening Post,* on May 14, Florence Kelley, writing of "Women's Part in Post-War Problems," deals with the need of a statesman-like land policy to prevent congestion of population and of industry:

"After the Civil War, a half-century ago, the civilized world marveled at the instantaneous absorption of two armies, North and South, into a life of peaceful employment. That was possible, because of

HOW ONE MAN HAS MOVED AHEAD IN THE CHAMBER OF COMMERCE FIELD

ORGANIZATION ACB SERVICE

Why not follow his example?

Just a short time ago one of the former students of the American City Bureau Summer School took a position as secretary of a vigorous Chamber of Commerce at $6,000 a year. He is under thirty years of age. When he attended the Summer School two years ago his salary was $1,800 a year as a college professor. Since then his advancement has been rapid.

No, we do not mean to infer that such rapid advancement is the customary result of attendance at the Summer School. That is something which must depend on the individual. This man succeeded because he had genuine ability. However, the School gave him an opportunity to develop and apply this ability.

The student to whom we have reference is only one of many who have been greatly helped by the School. Most of the students have either advanced materially in their present positions or moved on to better positions elsewhere.

The School is not a money-making institution. Our work is organizing Chambers of Commerce. Our continued success depends on the continued success of the Chambers of Commerce we organize. We must be able to put such bodies in touch with competent secretaries. The school has been created mainly to help us accomplish this result.

One clear indication of the fact that the school has been helping men succeed, is its rapid growth. It started in 1915 with fifteen students. The enrollment increased to fifty-seven in 1916, and ninety in 1917. It will be considerably higher this year.

Eagles Mere Park, Pa., provides a delightful location for the School. There is a beautiful spring-fed lake, with excellent facilities for boating and bathing. Situated high in the Alleghany Mountains, the nights are uniformly cool. The Park itself is a private forest reserve nearly a thousand acres in extent.

The School will occupy only two weeks—from July 8 to 19, 1918

Why not make this year's vacation prepare you mentally for one of the most fascinating fields of opportunity which the development of the nation has provided—in addition to refreshing you physically? Why not at least send us the attached blank for the pamphlet which tells about the school?

- -

Date.....

American City Bureau
Tribune Building, New York

Gentlemen:—

Send me your pamphlet "A Call to Men Who Can Lead," which tells about the A. C. B. Summer School for Chamber of Commerce Secretaries.

Signed.....

Address.....

the free land still under control of the Federal Government and available for gifts to the veterans, multitudes of whom were, at the close of the war, still in their twenties, hardy in body and mind, and available for life as pioneer farmers. When the present war ends, that process cannot be repeated, because the land is now monopolized.

"There is no prospect that women of ages corresponding to those of the returning soldiers will willingly turn their backs upon war wages and standardized labor conditions—such as the eight-hour day—to become farmers' wives. Perhaps the most beneficent thing that women of intelligence and power could, during the war, contribute toward the solution of post-war industrial problems would be so to develop the land army, the farm unit plan, or any cognate scheme, that it can serve as training for great bodies of women in high-grade agriculture and horticulture.

"Combined with the Australian plan of government, acquisition of vacant land for redistribution, war-time training for women in agricultural occupations might offer to young adult-workers of both sexes a happy modern substitute for the hardships of homesteading, which a vast population suffered at the close of the Civil War. Is any other substitute feasible?

"Only the united, intelligent, and infinitely patient effort of men and women together can so remodel our laws which govern land tenure and water development as to make the home-coming of the soldiers the Great Deliverance to which they are entitled.

"The choice is unavoidable. The dilemma is inherent in the situation. Either the nation must deal anew with the land in the interest both of the returning army and of the multitudes who have held the soldiers' places in their absence—doing their work and maintaining them, too—or there will be congestion of population and of industry such as history has never had to record. Unless a statesman-like policy is soon adopted, a terrifying aggravation of all the present forms of congestion seems inevitable. And all the while untilled land enough to feed the world will be held out of use or half-used."

Announcement of Prize-Winner in National Creed Contest

AN AMERICAN'S CREED

I believe in the United States of America as a government of the people, by the people, for the people, whose just powers are derived from the consent of the governed; a democracy in a republic; a sovereign nation of many sovereign states, a perfect union, one and inseparable; established upon those principles of freedom, equality, justice and humanity for which American patriots sacrificed their lives and fortunes.

I therefore believe it is my duty to my country to love it; to support its constitution; to obey its laws; to respect its flag, and to defend it against all enemies.

William Tyler Page, of Friendship Heights, Md., was the winner of the $1,000 prize offered by the city of Baltimore thru Mayor James H. Preston for the best American's creed,* and its formal acceptance, marked by a simple yet impressive ceremony, took place April 3, in the public hearing room of the national House of Representatives.

Its language is a composite of ideals taken from the Constitution of the United States, the Declaration of Independence, the Federalist, the Federal Oath of Allegiance, Washington's Farewell Address, Lincoln's Gettysburg speech, Webster's speech in the Senate, January 26, 1830; Edward Everett Hale's "The Man Without a Country," the Star-Spangled Banner, the Army and Navy regulations, a War Department circular on flag etiquette of April 14, last, and the great seal of the United States.

* Announced in THE AMERICAN CITY, June, 1917, p. 641.

MUNICIPAL SURVEYS

A quick and effective way for city and county governments to reduce expenditures, increase revenues and give more and better service. Special attention to

Salary Standardization
Accounting
Audits
Charter Drafting
Budget Systems
Police and Fire
Highways
Health and Charities
Institutions
Schools
Public Utility Service and Rate Studies
Refuse Collection and Disposal
Methods of Taxation, Etc.

12 years' experience throughout U. S. and Canada. Write for literature. Estimates furnished.

BUREAU OF MUNICIPAL RESEARCH, 261 Broadway, New York City

Hooray! They're Makin' a Playground!

That's why the kids are so happy. They know that a playground in their vicinity will mean no end of fun for them. You can make all the kids in your town happy. Write me for printed matter on how to plan and equip a model playground.

HOWARD GEORGE
Philadelphia - Pa.
"The Playground Outfitter"

SANITARY DRINKING FOUNTAINS

LIPS CANNOT TOUCH IT
WASTE WATER FROM MOUTH CANNOT RETURN TO THE BUBBLER
Ideal for Parks and Schools
Write for free Booklet
PURO SANITARY DRINKING FOUNTAIN CO.
125 Main St., Haydenville, Mass.

FOUNTAINS
DISPLAY and DRINKING
LAMP STANDARDS
OVER ONE THOUSAND PATTERNS
THE CASEY HEDGES CO.
CHATTANOOGA, TENN.
Chicago **Cincinnati**

Coöperation Between Hotels and State Department of Health in Maine

By C. E. Turner

Instructor in the Department of Biology and Public Health of the Massachusetts Institute of Technology

ALTHO in the past the Hotel Association in the state of Maine has defeated three legislative bills for hotel inspection, it is now energetically coöperating with the State Department of Health to secure an inspection which shall be regular, detailed and efficient. The hotel men have come to believe that good hygiene is good business, while the Health Department sees here an opportunity to promote health in a highly effective manner. The basis of such a coöperation may be worthy of brief consideration.

It was the privilege of the author to become acquainted with hotel men and hotel conditions in the fall of 1917, while engaged in making a sanitary reconnaissance of 150 hotels, under the direction of Health Commissioner Dr. L. D. Bristol of the newly reorganized State Department of Health. Those who summer in Maine know that most of the hotels are in excellent condition, but, as might have been expected, a few of the cheap hotels were found to possess definite health dangers.

Learning exactly what conditions are, the hotel proprietors see three definite reasons why regular hotel inspection is a good business proposition:

In the first place, hotel men realize that the great majority cannot afford to have their business jeopardized by epidemics of disease which may arise at hotels under careless management.

Secondly, there are many sanitary problems which confront every hotel proprietor in maintaining the proper condition of the building, the lot, food handling, food supply, garbage disposal, water supply, milk supply, plumbing, toilets, sewage disposal, and employes' quarters. By coöperative inspection he may secure, without expense, the expert advice of the State Department of Health upon these matters. Such advice is especially valuable to those men who must solve, individually, the problems of water supply and sewage disposal.

The third and most important advantage to the hotel proprietor lies in being able to guarantee to his patrons the sanitary condition of his establishment. The time has come when good hygiene and sanitation are keenly appreciated by the general public, and no better advertisement can be had than a certificate showing that the hotel has been inspected and conforms to every requirement of a modern and active health department.

But the Health Department also gains from the coöperation. The friendship of the hotel man is a valuable asset to a health officer of either a city or a state, placing him in touch with the sanitary problems of each locality, for once the hotel proprietor has become interested and has learned the importance of sanitation there is no one more solicitous for the health welfare of his community.

In Maine the Health Department and the Hotel Association are putting the proposition thru hand in hand, and it is going to be good business for both. After the preliminary reconnaissance, tentative rules and regulations were prepared by the State Department of Health and discussed in detail with the members of the Hotel Association at their annual meeting. These regulations were unanimously approved by the Association and have since become a part of the sanitary law of the state, so that after receiving a satisfactory inspection every hotel will have beside its register a certificate of its sanitary condition, issued by the State Department of Health.

—yes, some twenty years ago

Twenty years ago, we made a big lot of Enameled Iron Street Signs for the City of Baltimore, but we haven't sold the City many since—only because

THE TOWN HASN'T NEEDED THEM

The signs we sold them twenty years ago are still doing business—that's the economy of "BALTO" Guaranteed Porcelain Enameled Iron Municipal Signs.

That's the proof that there is no "just-as-good."

If you can afford to experiment with low prices (?) you're fortunate, but the taxpayer pays the freight. Our product is the one absolutely dependable out-of-door municipal sign on the market, and we can prove it if given half a chance.

GIVE US THE CHANCE TODAY

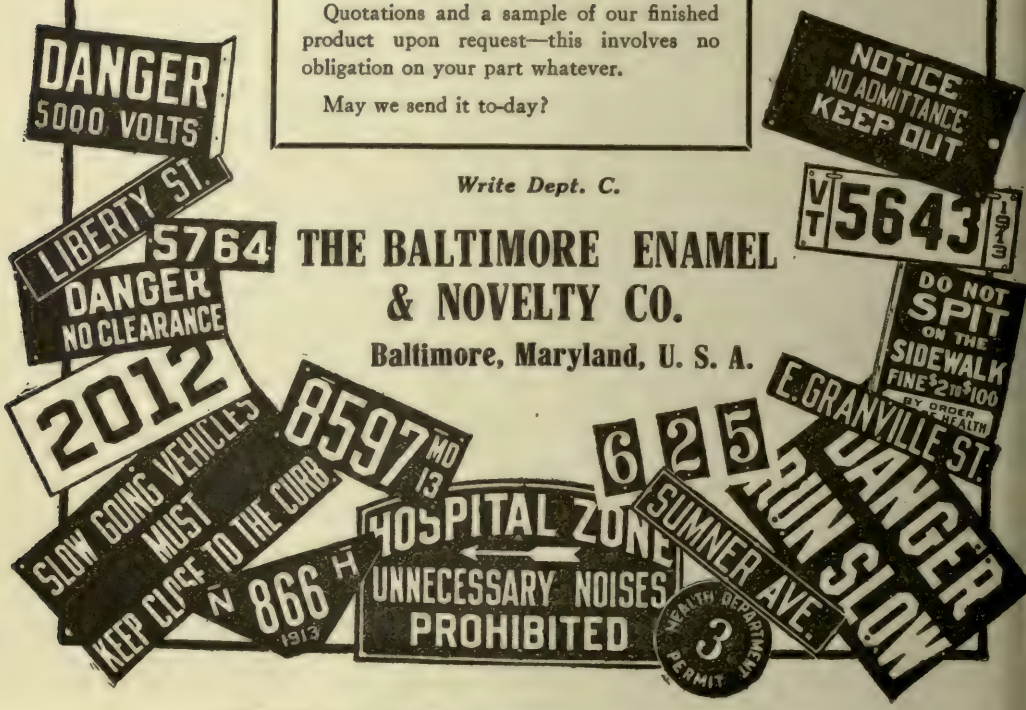
Quotations and a sample of our finished product upon request—this involves no obligation on your part whatever.

May we send it to-day?

Write Dept. C.

THE BALTIMORE ENAMEL & NOVELTY CO.

Baltimore, Maryland, U. S. A.



Municipal and Civic Publications

SHAAD, GEORGE C., E. E., Professor of Electrical Engineering, University of Kansas.

Power Stations and Transmission. A comprehensive treatise on electrical power station equipment, design and management, and the erection and maintenance of proper transmission lines. 1917. 95 pp. Photographs, charts, diagrams, tables. **$1.00**

Municipal officials in charge of public utilities in the larger cities will find much to interest them in this compact treatise. The book is divided into two sections, treating, respectively, with power stations and power transmission. Under the first head are considered: location of station; general features; steam plant; hydraulic plant; gas plant; electric plant; switchboards; substations, and buildings. Under the second: conductors; distribution systems; transmission lines; transformers; overhead lines; underground construction, and miscellaneous factors. Many tables of useful data, wiring diagrams and descriptions of special features have been introduced which should be found valuable to the engineer.

ROBISON, EMILY, Compiler.

Vocational Education. (The Handbook Series.) 1918. 353 pp. **$1.25**

This book comprises over fifty selected articles by various authors, arranged under the following heads: Phases of Vocational Education for Youth; Industrial Education; Commercial Education; Agricultural Education; Household Arts; and Vocational Guidance. The book contains also a short introduction by the compiler and an excellent bibliograhphy.

KILPATRICK, VAN EVRIE, Principal, Carlisle School, New York City.

The Child's Food Garden. With a few suggestions for flower culture. 1918. 64 pp. Photographs, diagrams, tables. **48 cents**

This book will be welcomed by school teachers and civic workers thruout the country who are interested in teaching children how to grow vegetables to "help win the war." The author, who is president of the School Garden Association of America, has told the story of plant and vegetable growing in the simplest terms, and there is scarcely a page lacking its attractive photographic illustration. The book is divided into six sections treating respectively with "The Garden" (cultivation methods, tools, etc.); "Vegetables"; "Flowers"; "The Seasons"; "Preserving Vegetables and Fruit"; and "Plant Enemies and Friends." An appendix furnishes important data in regard to frost periods, planting depths, and canning and drying.

DIBBLE, SAMUEL EDWARD, Carnegie Institute of Technology.

Elements of Plumbing. 1918. 174 pp. Photographs, diagrams and tables. **$1.50**

Municipal officials in building and health departments who are interested in plumbing installations in public and private buildings will be glad to know of this handy-sized manual of the plumbing trade. It furnishes a complete resumé of approved processes and methods, covering tools and their uses; plumbing fixtures; solder mixtures; preparing and wiping joints; making connections to public sewers; sub-soil drains; pipe threading; hot-water heaters; insulation; gas fittings, etc. The final chapter contains some interesting comments on plumbing codes, and cites the provisions of a typical state of city plumbing code in so far as they relate to the actual installation of plumbing.

WHITAKER, CHARLES HARRIS, Editor, *Journal of the American Institute of Architects;* ACKERMAN, FREDERICK L., Architect, New York City; CHILDS, RICHARD S., Secretary, Committee on Industrial Towns, New York City, and WOOD, EDITH ELMER, Expert in Housing Legislation, Philadelphia, Pa.

The Housing Problem in War and in Peace. 1918. 116 pp. Photographs, plans, maps. **$2.25**

This book is composed of reprints of a series of articles by the above-named authors in the *Journal of the American Institute of Architects.* It discusses the industrial housing problems in England, and the United States, both before and during the war, and affords a glimpse of the new and brighter day that is dawning when this important factor in human welfare and happiness shall be given the place in national, state and municipal development programs that its proven influence on national life merits.

SECRIST, HORACE, Ph.D., Associate Professor of Economics and Statistics, Northwestern University.

An Introduction to Statistical Methods. A textbook for college students, a manual for statisticians and business executives. 1917. 502 pp. Charts and tables. **$2.25**

The author of this book informs us: "More and more economic and business policies are being advocated after careful study of facts. . . . . The tendency to . . . . stand sponsor for a program or to agitate a reform upon an appeal to natural rights or to the innate goodness or perversity of human nature, is rapidly being overcome." As in business, so also in the problems of municipal government—more and more is it becoming necessary to carefully study the underlying facts. For this reason THE AMERICAN CITY wishes to call this statistical manual to the attention of municipal officials and students. It tells of: the meaning and application of statistics and statistical methods; sources and collection of statistical data; units of measurement; purposes of study; classification and tabular presentation; diagrammatic and graphic presentation; averages; index numbers; comparison and correlation, etc.

MARKS, WILLIAM D., Ph.B., C. E., Consulting Engineer.

Practical Rate Making and Appraisement. 1914. 269 pp. Tables, diagrams. **$2.00**

This volume presents in practical, brief form the principles of rate-making and appraisement, together with reports of cases showing the application of these principles. Caution and perfect open-mindedness are emphasized as absolutely essential in the making of such reports. The author's reports on gas rates and prices in Spokane and electric lighting prices in Minneapolis are given. There are chapters on Quantity Rates for Electricity; Methods of Appraisement; Overhead Charges; Depreciation; Comparative Appraising; various studies of Value; Books and Accounts; The Law of Demand for Electricity; Gas Sales per Capita; The London Sliding Scale; and Capitalization, Assets and Profits of Massachusetts Gas Companies.

Lawn Beauty with Economy and Conservation of Labor

Under ordinary conditions, hand mowing is inefficient and expensive. This year, with labor at a premium and almost impossible to obtain, hand mowing is prohibitive.
The solution to the lawn cutting problem is the

FULLER & JOHNSON
MOTOR LAWN MOWER

The Fuller & Johnson Mower combines the convenience of a hand mower with large cutting capacity. In one day's time one man can cut five acres of lawn with the Fuller & Johnson. He can cut it so perfectly that no after-trimming around trees, shrubs or driveways will be necessary. He can cut it when needed instead of waiting, as with a horse mower, until the turf is solid so that the lawn won't be marred by the horse's hoofs.
This is what the Superintendent of the Park District of Oak Park, Ill., has to say about the Fuller & Johnson:

"Replying to your inquiry of July 5th, we are glad to say that the Fuller & Johnson Motor Lawn Mower which we purchased from you a few months ago has been in constant use, has required very little repairs and has been in every way very satisfactory, so much so that were we in the market for another machine of this type, I am sure we would not hesitate to purchase another of this kind."

All over the country, in parks, cemeteries and on large estates, Fuller & Johnson Motor Lawn Mowers are fast replacing hand mowers, horse mowers and the heavier types of motor mowers. Where you find the most beautifully kept lawns there too you will find the Fuller & Johnson Mowers, for good business judgment as well as lawn beauty dictate their use. Let us send you complete details about the Fuller & Johnson. Write for a copy of our new book entitled "A Better Lawn."

MANUFACTURERS DISTRIBUTING CO.
473 Fullerton Building St. Louis, Mo.

INSECT-BAN

TREE TAPE
Bars all climbing pests

INSECT BAN is a tape in a protecting shield, saturated with a newly discovered powerful insect repellant. Cannot injure the tree. Harmless to birds or animals—but death to insects.
Shipped in rolls. User cuts to suit. Lasts whole season. Write for price, sample and booklet. Tells all about insects and worms, their habits, how to combat them, etc.

District managers and selling agents wanted

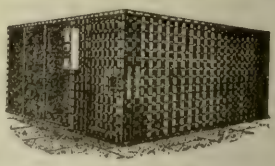
The Eggert Chemical Company
CANTON, OHIO

The ELGIN

The machine that sprays the street, sweeps it, and collects the sweepings. Driven by motor. Cuts a big slice off your Street Cleaning Department expenses.

Write for illustrated matter.

ELGIN SALES CORPORATION
NEW YORK and CHICAGO



Ornamental Wire, Iron and Brass Work

Send for our Illustrated Catalogue

Jail Cells and Jail Work, Cemetery Entrances and Fence, Mausoleum Doors and Equipment, Fire Escapes, Flag Poles, Park Settees, Lawn Furniture.

Consulting with us about your problems and asking for estimates does not place you under any obligation whatever.

E. T. BARNUM, *Wire and Iron Work,*
DETROIT, MICH.

24 inch

CAST IRON PIPE

12,000 ft. First class Bell and Spigot, 12 ft. lengths. Weight 183 lb. per foot.

ZELNICKER IN ST. LOUIS

Get Bulletin 237—72 Bargain pages in

Rails, Cars, Locomotives, Machinery, Tanks, etc.

The Framingham Community Health Demonstration.
Framingham Monograph No. 1, General Series. The Program. Framingham Community Health and Tuberculosis Demonstration of the National Association for the Study and Prevention of Tuberculosis. 1918. 24 pp. (Apply to the Community Health Station, Framingham, Mass.)

Safety First!
Things You Must Know for Safety. A book everyone should have. Published by the Public Safety Commission of Chicago and Cook County. Numerous full-page illustrations. Tables, statistics. New edition, 1917. 192 pp. Price, 10 cents. Apply to Public Safety Commission, 2838 South Michigan Avenue, Chicago, Ill.)

Care for Dependents of Soldiers and Sailors.
Provision for the Care of the Families and Dependents of Soldiers and Sailors. By Julia C. Lathrop, Chief, United States Children's Bureau. Reprinted from Proceedings of the Academy of Political Science. 1918. 12 pp. (Apply to Academy of Political Science, New York City.)

Retardation in Cincinnati Schools.
Retardation in Cincinnati Public Elementary Schools. Volume 1, Number 1, of the Studies from the Helen S. Trounstine Foundation. By Helen S. Trounstine. Charts, tables, graphs. 1918. 44 pp. Price, 50 cents. (Apply to the Foundation, Room 806, Neave Building, Cincinnati, Ohio.)

Classification and Salary Standardization in St. Louis.
Classification and Standardization, and Description of Duties of Positions in the Classified Service of the City of Saint Louis. Prepared by the Efficiency Board of St. Louis. 1918. 238 pp. (Apply to W. E. Van Pelt, Secretary of the Board, 5307 Devonshire Avenue, St. Louis, Mo.)

Rochester's Budget for 1918.
1918 Budget of the City of Rochester, N. Y. By H. D. Quinby, City Comptroller. 50 pp. 1918. (Apply to Rochester Bureau of Municipal Research, Inc., 25 Main Street, East.)

Forestry and Community Development.
Bulletin No. 638 of the United States Department of Agriculture. This pamphlet graphically presents the evils attendant upon and resulting from deforestation, and shows what the Government and state forestry departments are doing to reforest devastated areas. Photographs. 1918. 35 pp. (Apply to the Department of Agriculture, Washington, D. C.)

Toronto Research Bureau Activities.
Fourth Annual Report of the Toronto Bureau of Municipal Research, year ending February 28, 1918. Tables. 1918. 16 pp. (Apply to the Bureau, 813-820 Traders' Bank Building, Toronto, Canada.)

City Planning for Davenport, 1918.
Under this title, Roscoe E. Sawistowsky, City Engineer, presents his report to the Mayor and City Council of Davenport, embodying recommendations and suggestions for that city's future development. The report is very complete, and should be of interest to municipal officials and city plan commissions everywhere. Charts, photographs, diagrams, maps, plans. 1918. 81 pp. 75 cents. (Apply to City Clerk, Davenport, Iowa.)

Chicago Social Service Directory.
A very handy and complete guide to the social agencies of Chicago, with addresses and pertinent information in brief regarding each. Second Edition. 1918. 282 pp. Price, 25 cents. (Apply to Louise Osborne Rowe, Commissioner, Chicago Department of Public Welfare, 805 City Hall Square Building, Chicago.)

Housing Women War Workers.
Suggestions for Housing Women War Workers. Made to the Secretary of War by the Housing Committee of the Young Women's Christian Association. January, 1918. 20 pp. Illustrated. (Apply to the Committee, 600 Lexington Avenue, New York City.)

Dust Prevention and Road Preservation.
Progress Reports of Experiments in Dust Prevention and Road Preservation, 1916. Bulletin No. 586 of the United States Department of Agriculture, contributed from the Office of Public Roads and Rural Engineering. Charts, tables. 1918. 78 pp. Price, 10 cents. (Apply to the U. S. Department of Agriculture, Washington, D. C.)

Functions of a Municipal Sanatorium.
This pamphlet, issued by the New York City Department of Health as No. 64 of the Reprint Series, deals with the question of treating sputum-positive consumptives not now reached by any preventive measure. The author is Charles B. Slade, M. D., Attending Physician, Municipal Sanatorium, Otisville, N. Y. 8 pp. (Apply to the Director, Bureau of Public Health, Education, Department of Health, corner Centre and Walker Streets, New York City.)

Preventing Tuberculosis Among Children.
What We Are Doing to Prevent Tuberculosis Among Children. By Louis I. Harris, Dr. P. H., M. D., Bureau of Preventable Diseases, New York City Department of Health. 1918. 6 pp. (Apply to Director, Bureau of Public Health Education, Department of Health, corner Centre and Walker Streets, New York City.)

Neighborhood Americanization.
This is the title of a pamphlet of unusual interest treating the question of foreigners in our larger cities, and the problem of Americanizing native Americans. The pamphlet contains an address by Frances A. Kellor before the Colony Club of New York City. A list of pamphlets on Americanization is enclosed with the pamphlet. 1918. 27 pp. (Apply to the National Americanization Committee, 29 West Thirty-ninth Street, New York City.)

Home Vegetable Gardening.
A handy little pamphlet containing practical suggestions on the planting and care of "The City and Suburban Vegetable Garden." By H. M. Conolly, Assistant Horticulturist in Agricultural Education. Farmers' Bulletin 936, United States Department of Agriculture, contributed by the Bureau of Plant Industry and the States Relations Service. (Apply to the U. S. Department of Agriculture, Washington, D. C.)

War Vegetable Gardening.
A very clear and understandable pamphlet on "War Vegetable Gardening and the Home Storage of Vegetables" has been prepared by the National War Garden Commission for free distribution to war gardeners." Photographs, diagrams, tables. 1918. 31 pp. (Apply to the Commission, Maryland Building, Washington, D. C.)

Home Canning and Drying.
"Home Canning and Drying of Vegetables and Fruits" is the title of a pamphlet which all housewives should have, and which is being distributed free by the National War Garden Commission. It graphically illustrates the latest and best methods of putting up vegetables and fruits. Photographs, diagrams, drawings, tables. 1918. 31 pp. (Apply to the Commission, Maryland Building, Washington, D. C.)

Community Drying Plant.
A Successful Community Drying Plant. By C. W. Pugsley. Farmers' Bulletin 916, United States Department of Agriculture. December, 1917. 12 pp. Illustrated. (Apply to the Division of Publications of the Department, Washington, D. C.)

What to Eat and How to Cook It.
A 72-page book that should be in the hands of every housewife has been prepared for distribution by the Illinois State Council of Defense. This "Official Receipt Book" discusses the present food situation, and contains valuable hints on wise marketing. The body of the book is given over to war-time recipes. Food charts and tables illustrate the proper proportions of food elements for correct eating. A nominal charge of five cents, or ten cents if mailed, covers the cost of the book and postage. 1918. (Apply to the Illinois State Council of Defense, 120 West Adams Street, Chicago.)

MOTT LAMP POSTS

STANDARDS OF MERIT

Special Designs of Lighting Standards For Type C Lamps

LAMP POSTS FOR ALL REQUIREMENTS

FOUNTAINS

Display and Drinking

For PUBLIC SQUARES, PARKS, PLAYGROUNDS, Etc.

ENTRANCE GATES, RAILINGS, SETEES

CATALOGUES ON APPLICATION

THE J. L. MOTT IRON WORKS

Fifth Avenue and 17th Street, New York

B. M. E. TRAFFIC SIGNS COMMAND ATTENTION

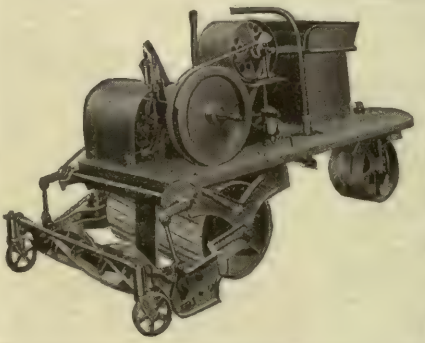
Exclusive design — **Superb finish**
Cast-in, raised letters — **Will stand severest abuse**

Catalogue and prices on request.

Buffalo Municipal Equipment Co.

Mutual Life Bldg. — **Buffalo, N. Y.**

Patentees and Makers of Municipal Equipment.



The Milbradt Power Lawn Mower

The Milbradt is a perfect power lawn mower. It will cut the grass close and clean, do it quickly and economically; a machine so simple in construction and operation that any one can handle it.

It cuts a swath 38 inches wide and has a speed twice the gait of a horse.

We will ship a mower on approval and guarantee same to be satisfactory in every respect.

Write for Circular Matter

MILBRADT MFG. CO. : St. Louis, Mo.

Methods, Materials and Appliances

News for Boards of Public Works, Engineers, Contractors, Purchasing Agents and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

Hydrants and Fire Protection

A city may have a 100 per cent efficient fire department well equipped for all emergencies; but if the *hydrant* fails when the test comes, all this efficiency may count for nothing.

A hydrant which has been constructed to overcome many difficulties that experience has brought to light in this field is that manufactured by the Rensselaer Valve Company, Troy, N. Y. One of the most popular of the "Corey"

6-INCH "COREY" FIRE HYDRANT

hydrant line is the six-inch hydrant shown herewith. It is equipped with two 2½-inch nozzles and one steamer nozzle, and operates on the knuckle-joint principle. A special drip valve at the bottom of the hydrant renders it frost-proof. When the spindle is turned, the main valve gate is opened to let the water in from the supply pipe, and the same movement closes the drip valve. A reverse twist closes the main valve and opens the drip valve, so that the water in the hydrant may flow out. The most satisfactory method of draining these hydrants is to connect the drip valve by a small pipe with the sewer system. Such connections are furnished at a slight additional expense by the company.

As will be noted, the top of the hydrant is detachable, and all the interior parts are easily accessible. A special curved inner hood relieves the top of any pressure strain and deflects the water in an easy curve into the hose nozzles. This prevents churning and friction loss inside the hydrant. The inside diameter of the standpipe is extra large, in order to remove all friction loss in the hydrant barrel and to make the hydrant very strong and rigid. All the working parts are solid bronze or bronze mounted, and are consequently expensive to build, but are correspondingly effective and durable. "Cheapness is not what you pay, but what you get for what you pay."

Interested officials who desire further information concerning this and other hydrants should write to the Rensselaer Valve Company at Troy for its Catalogue-F, which presents its complete line.

✣ ✣

An Industrial Plant's Fire Protection

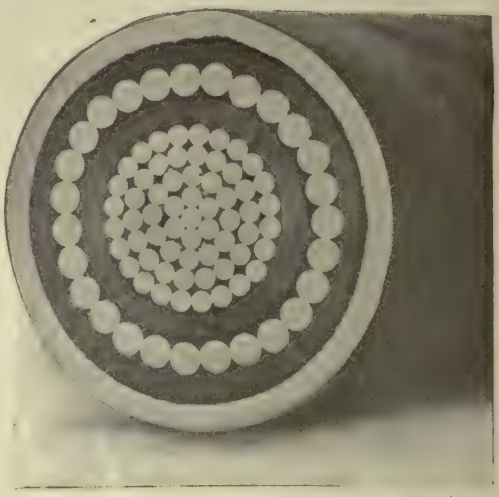
Twelve years, with not a single fire loss to exceed $100, is the record of the B. F. Goodrich Rubber Company, Akron, Ohio. Altho this corporation carries millions of dollars of fire insurance, no claims have been asked in this period. This record is remarkable when one considers that the company's property includes over sixty factory buildings with a total floor space of over 100 acres, and that the company employs over 19,000 people. According to R. W. Parry, Fire Chief of the Goodrich Company, this record is the result of "constant watchfulness."

Twelve fire-fighters guard the immense properties of the company. These men have modern quarters located in the heart of the plant, and can reach the farthest point among the factory buildings, a distance of nearly 1,500 feet, in a fraction over two minutes. These excellently drilled men are everlastingly on the lookout for fire hazards. They make daily inspection tours of the plant and on these trips see that aisles and doorways are not blocked. They also inspect the fire apparatus daily.

Chief Parry and his organization have the coöperation of every employe of the institution. Drills are conducted in the different departments of the plant; for instance, 225 girl employes of one building, scattered on five floors, have repeatedly left the building in the short space of one minute and twenty seconds during fire drills.

Mr. Parry states that 90 per cent of the small fire flashes that might terminate in large and costly conflagrations are extinguished before the company department arrives. These

SIMPLEX WIRES AND CABLES



INSULATED WITH

RUBBER, CAMBRIC OR PAPER

SIMPLEX WIRE & CABLE CO

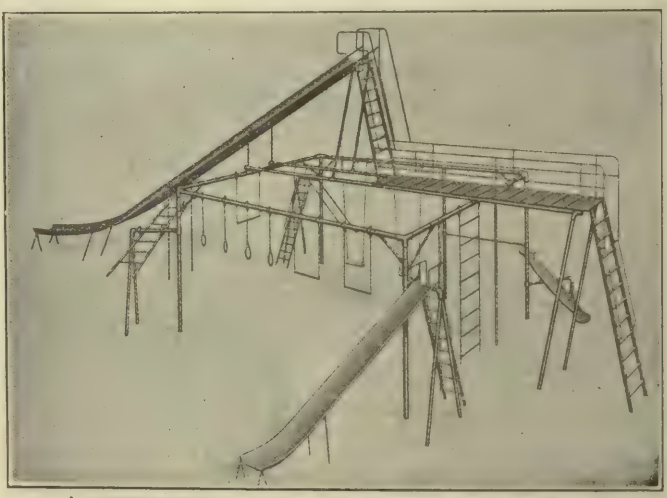
MANUFACTURERS

201 DEVONSHIRE ST. BOSTON

CHICAGO SAN FRANCISCO

All Steel Playground Apparatus

THE EUREKA LINE



THE EUREKA STUDEBAKER PARK COMBINATION

Swings, Giant Strides, Flying and Traveling Rings, Teeter Boards and Ladders, Aluminum and Maple Slides, Park Settees and Lawn Swings, Merry-Go-Rounds, Horizontal Ladders and Combinations.

Cat. No. 16 Full Outfits And Fittings Only

The Ashland Mfg. Company

Dept. 14 Ashland, Ohio

To so form the life of our youth that they need never be reformed is indeed a great achievement

Eureka **E**quipment **U**tility **U**nexcelled **R**enowned **R**ectitude **E**fficient **E**conomical **K**iddies **K**ind **A**ll-Steel **A**pparatus

FIRE-FIGHTERS THAT GUARD THE GOODRICH PLANT IN AKRON, OHIO

flashes are put out by employes by the aid of chemicals. Seventy-five per cent of these small fires are without loss caused by water; in other words, only 25 per cent of them reach the heat demanded to open the automatic sprinkler heads. These heads contract and open at 155 degrees heat. Another damage prevention is said to be the use of soapstone instead of sand. Rubber cement is used in large quantities in many sections of the plant, and, while soapstone serves the same purpose as sand, it has no injurious effects on rubber and rubber cement.

The fire-fighting apparatus of the Goodrich Company consists of one hose cart, 135 chemical tubes, 28,600 feet of fire hose, 2,000 fire pails, 543 fire extinguishers ranging in size from three- to twenty-gallon capacities, two fire foam extinguishers, which are used only on oil fires, and 17,938 sprinkler heads.

An Efficiency Contest for Packard Trucks

The Packard Motor Car Company is co-operating with the Highways Transport Committee of the Council of National Defense by inviting Packard truck owners to enter a three-months' efficiency test, beginning June 1. The $5,000 in awards which it offers to

CAMPBELL CENTER SCHOOL PLAYGROUND, IN DETROIT, EQUIPPED WITH AMERICAN PLAYGROUND DEVICE COMPANY'S APPARATUS

Keep the Playgrounds Going!

During the present world war there must and will be, many sacrifices made, but our children must fully be cared for in their school and recreation life.

Let our next generation be strong, sturdy and brave—you can help the children of today to become all these things.

THE FUN-FUL PLAYGROUND EQUIPMENT LINE

will help you. Fun-Ful apparatus is in use all over the country. It is so popular because of its quality and latest design. If your town is without a playground, we will plan a model one for you—without obligation.

Write for further facts and illustrated material.

HILL-STANDARD CO.

216 Fun-Ful Avenue **Anderson, Ind.**

ELGIN SWEEPER-SPRINKLERS IN SERVICE IN SAN FRANCISCO

promote greater motor truck efficiency will be divided according to the following truck classifications:

Class A: one- and one-half and two-ton trucks; owner's award, $1,000; driver awards, $500, $100 and $75.

Class B: three- and four-ton trucks; owner's award, $1,000; driver awards, $500, $100 and $75.

Class C: five- and six-ton trucks; owner's award, $1,000; driver awards, $500, $100 and $75.

"Neither the age of the truck nor the line of business in which it is engaged is a handicap in the test. These two factors and many others are taken into consideration, so that all the vehicles will compete on an absolutely fair and impartial basis," says R. E. Chamberlain, truck sales manager of the Packard company. "Any truck, no matter whether it hauls gravel, ice-cream or coal, has an equal opportunity with every other truck in its class, and so has its driver.

"Besides the freight cars that will be saved for urgent government purposes, congestion at hundreds of shipping platforms will be cleared up and more tonnage of food and other necessaries moved."

A Sweeper-Sprinkler that Leaves no Sweepings Behind

Some years ago, the Elgin Street Sweeper Company, Elgin, Ill., conceived the idea of building a motor-driven machine that would sprinkle, sweep and collect at one operation, and would require the services of but one man to operate it. After a period of planning, building and experimenting, the first Elgin combination machine was sold, in 1914. Since then interest in the Elgin has increased until at the present time more than fifty cities have installed these machines as a satisfactory means of cleaning streets, some cities having purchased several to care for local demands.

The Elgin cleans a swath eight feet in width, leaving a damp, smooth ribbon behind it, with no surplus of water, and no sweepings for the "white wings" to push into the sewer. Water from a 180-gallon tank directly behind the front axle is sprinkled in a fine shower on the pavement to be swept, and before the water has had time to work thru the dust and make mud, the broom, rotating on the pavement, catches up the dampened street refuse and tosses it into an enclosed conveyor, which in turn carries it into a large enclosed hopper, capable of holding 2¾ cubic yards. Under normal conditions, 180 gallons of water will suffice for an hour of cleaning. When in operation, the machine should travel at a maximum speed of 6 miles per hour. This is equivalent to a maximum capacity of 48 miles 8 feet wide per 8-hour day. As the illustration will show, the motive power, a 45 H.P., 4-cylinder engine, is carried in the rear, over the cushion steering wheel. As it is carried on three wheels, the machine can turn almost within its own space. All operations are controlled from the driver's seat, and the operator has to leave his seat only to crank the engine or to attach the hose to the hydrant to refill the tank.

The broom and elevator have two speeds, independent of the speed of the machine—fast for very dirty streets, slow where better conditions prevail. The operator's seat is so situated that he can watch all the street ahead and regulate his machine to take care of the particular work he encounters. Should he pass along a residential street with light traffic, the machine is driven at high speed, the broom at low, with low water pressure. For rough trucking sections, the machine is driven slowly and the broom at high speed, with a medium flow of water. For very dusty, smooth streets, the machine is thrown into "second," the broom revolves at low speed, and the water is turned on full. The machine can be operated for an hour before the hopper is filled, and the sweepings are quickly and easily dumped by throwing over a lever at the driver's feet. The water is forced to the pavement thru atomizers by compressed air, and not by gravity, so that the amount can be varied by turning a hand wheel at the driver's side. The water is strained before it passes thru the nozzles, so that they are kept free. The strainer is controlled by a hand lever, and can be easily cleaned.

The approximate daily operating cost of the machine may be determined by taking into consideration the following factors: the cost of one operator; eight gallons of gasoline, two quarts of oil, and broom wear, which last runs from $1.50 to $3.00 per day, according to the market price and the kind of fibre used.

When worn out, the brooms can be quickly

PLANNING A PLAYGROUND

The problem with which you are confronted in planning your new playgrounds have probably been worked out over and over again by us, and our Engineering Department is equipped to solve any problem which may present entirely new features of construction.

Our service in planning your equipment incurs no expense or obligation. It reflects our 43 years practical experience. We know playground needs thoroughly. We have literally grown up with the playground movement.

WRITE FOR CATALOG "W". It is a recognized guide on Playground Equipment. It covers every form of apparatus that has been approved in actual practice.

FRED MEDART MFG. CO. St. Louis, Mo.

Gymnasium Outfitters—Steel Lockers

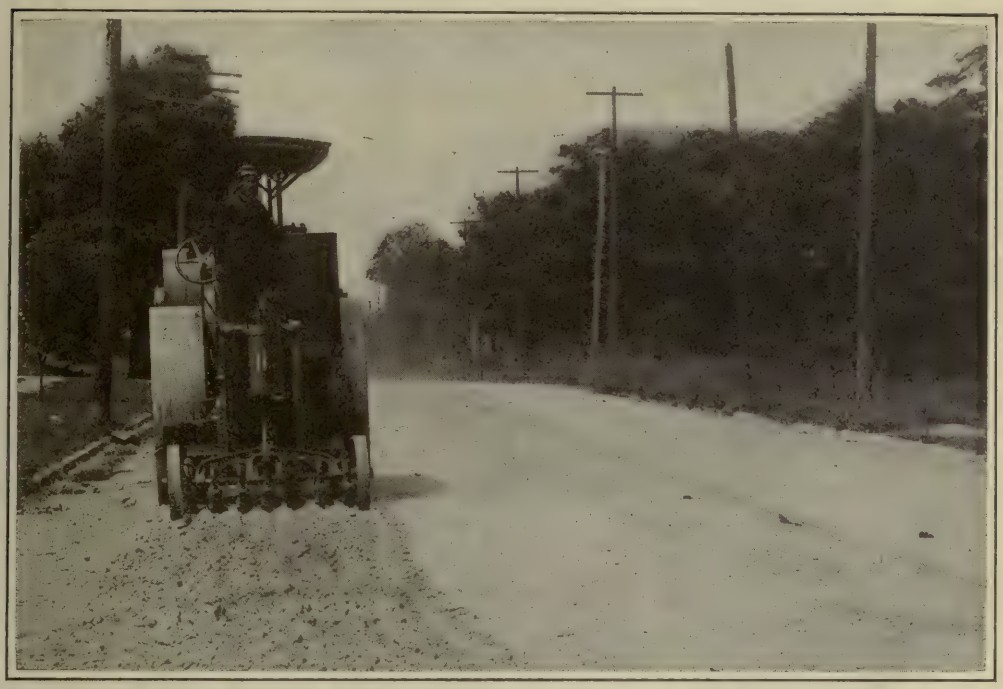
ALL MUNICIPALITIES NEED PLAYGROUNDS

The Playground not only betters the physical and moral tone of a city, but it is a real live investment. It cuts the perpetual moving population to a minimum which saves your manufacturer and your merchant.

American Apparatus will produce results.

WRITE FOR OUR CATALOGUE TO-DAY

AMERICAN PLAYGROUND DEVICE CO., W. 25th St., Anderson, Ind.



ROAD ROLLER WITH SCARIFIER ATTACHMENT IN OPERATION

refilled with fibre, 100 pounds being sufficient. For this purpose the company supplies a broom-filling rack. The brooms last from 7 to 15 8-hour days, according to the character of the work performed.

A Steam Roller and Scarifier Combined

A recently issued folder describes a scarifier attachment that can be used with either the steam or the motor-driven road rollers manufactured by the Buffalo-Springfield Roller Company, Springfield, Ohio. The scarifier is operated by air pressure applied direct from a compression cylinder which forms part of the attachment and which is, as the illustration shows, carried immediately over the scarifier.

Among the advantages that especially commend this scarifier may be mentioned the fact that it is always with the roller when needed, and can be operated by the man who operates the roller. It scarifies the entire width of the roller, approximately six feet wide, at the regular traveling speed of the roller.

Upon opening the valve lever, the teeth are instantly lowered to working position. The scarifier rises automatically over hidden obstacles, and can be instantly lifted by the operator in passing over cross-walks, manhole covers and sewer gratings. The width and depth of the cut can be varied to suit different working conditions.

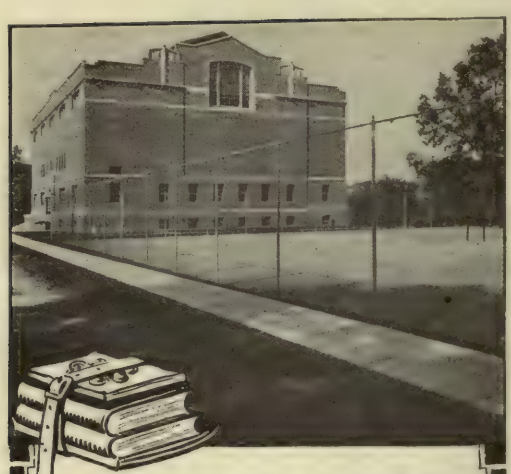
The digging tolls are mounted on separate arms. This avoids the usual clogging of materials ahead of the tooth bars, and permits extra cutting depth. The compression cylinder is capable of exerting force sufficient for tearing up hard stone streets and roads. The long stroke of the cylinder gives the elasticity required to maintain a uniform cutting depth on uneven surfaces. When not in use, the scarifier can be raised so as not to interfere with the ordinary functions of the roller.

Shade Trees Versus Sewers

Sad experience has taught many communities that it is not profitable to plant shade trees in close proximity to sewer installations. A notable example of the unfortunate results of planting trees too near the sewer is found in Goshen, Ind. It was discovered that the roots of some of the shade trees had grown into the sewer and clogged it up, and the city was forced to authorize cutting down the trees. As this did not produce any immediate relief, an attempt was made to kill the roots by boring holes in the stumps, pouring in acid and plugging the holes.

Finding that the sewer was still clogged with roots in spite of these measures, the city called upon the Turbine Sewer Machine Company, 195 Eleventh Street, Milwaukee, Wis., to clean out the roots and other debris. The illustration on page 601 shows the machine used for the purpose, together with part of the refuse taken from the sewer. The use of the machine proved very successful, and there is little doubt that its earlier utilization would have obviated the necessity of sacrificing the shade trees.

The machine cleans the sewer by a rotary scraping action. It may be either drawn or pushed thru the sewer, depending upon the



School grounds as well as the children are fully protected by this

EXCELSIOR

Chain Link Fence

As shown here it gives complete protection from outside influence as well as keeps the children within bounds. Does not obstruct the view and allows light and air from all points.

Excelsior Chain Link Fence is made of strong steel wires, heavily galvanized, of great tensile strength. They are particularly tough for the purpose and so woven as to make an exceedingly strong, firm, and durable fabric.

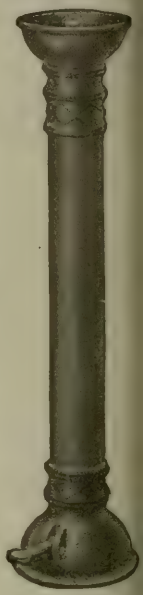
The posts shown here are galvanized steel, set in concrete or concrete footings. The top rail, of course, gives rigidity and prevents sagging. This fence can neither be climbed, burned nor broken down.

Send for catalog G, which gives information concerning the Excelsior products for public grounds.

WRIGHT WIRE COMPANY
Worcester, Mass.

Inexpensive Drinking FOUNTAINS

OUR bubbling fountains, the practical kind, are just the kind to be installed on your streets and boulevards, in your parks and squares and public playgrounds. The expense for installation is very small as is the upkeep cost.



We are specialists on fountains for drinking purposes. Place your requirements in our hands. Write for our catalogue showing our many designs.

RUNDLE-SPENCE MFG. CO.

MILWAUKEE, WISCONSIN

ROOTS AND REFUSE TAKEN FROM GOSHEN, IND., SEWERS WITH TURBINE MACHINE

amount of resistance encountered. For ordinary purposes a windlass and cable, which can be operated by one or two men, is provided for pulling the turbine machine. If the sewer is completely clogged, a forcing jack provides the power necessary to push the machine thru the affected portion. When the machine is in operation, a strong current of water is forced into and thru it to carry the debris on to the opening. The water is supplied from a street hydrant by means of a hose attached to the rear of the machine.

To those who are interested in this sewer-cleaning device, the company will be glad to send its literature, telling in greater detail of its operation and of the satisfactory results achieved in many cities.

Crushing Business

If this war is to be won, we must not only have immense man-power, enormous military material, economy in dress and food, and many other things, but we must also be allowed to do business. If we are to subscribe to Liberty Loans as we should like to, and if we are to have money to buy War Savings Stamps, and if the boys over there are to be backed as they should be by the population over here, the population must be allowed to continue its legitimate business, and must be encouraged, not discouraged, to extend its affairs, its trade and its manufacturing. Necessarily, business is more or less upset by a war, especially a world-wide war like that now in progress. Necessarily, many branches of business must almost cease to exist. Every one realizes those inevitable results of war, but on the other hand there is much that can be done, that must be done, in fact, if the country is not going to collapse and be unable to support the burden imposed upon it.

If all business, other than making munitions of war, and food supplies and ships, is to cease, then it follows that only those who are employed in the occupations mentioned will have any income, and the rest of the population will have to depend upon them for a living. We are told, for instance, not to build any houses. What, may we ask, are the men who would be engaged in building to do for a living? They are not all needed in shipbuilding, because many of the occupations have no connection with ships; they are not needed in other directions for the manufacture of war material, because that is being rushed to the limit. If the men are allowed to work at the occupations for which they are best fitted and could earn good wages, will they not be far better able to become bond buyers than if their occupation is taken from them?

Fundamental Principles of Water-Works Valuation

A pamphlet of unusual value to water-works officials has been made available by J. W. Ledoux, chief engineer of the American Pipe & Construction Company, and owner of the Simplex Valve & Meter Company of Philadelphia. This pamphlet contains a reprint from the *Journal* of the Engineers' Club of Philadelphia of an article by Mr. Ledoux, entitled "A Discussion of the Fundamental Principles of Water-Works Valuation." Mr. Ledoux is considered one of the foremost authorities in water-works construction in the United States, and his article should therefore be of considerable interest to all who are concerned with this branch of municipal administration. Copies may be secured from the author at 112 North Broad Street, Philadelphia, Pa.

Will Sell Ford Meter Boxes

Ira T. Collar & Co., of 925 Barnett Avenue, Kansas City, Kan., has been appointed district sales representative of the Ford Meter Box Co., of Wabash, Ind. This firm will handle the regular line of Ford meter boxes, yokes and other accessories for curb installations of water meters, and will be glad to answer inquiries from interested parties in its district.

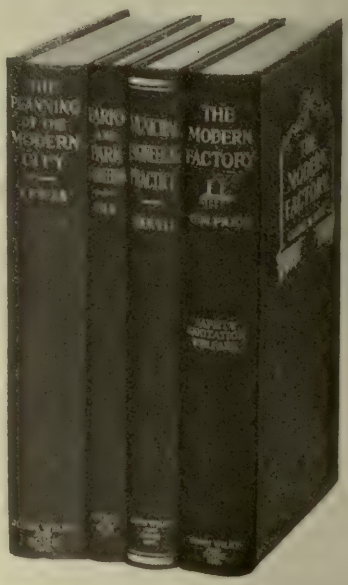
FOR THE MUNICIPAL ENGINEER

The Planning of the Modern City

A Review of the Principles Governing City Planning. By Nelson P. Lewis, Chief Engineer, Board of Estimate and Apportionment of New York City, etc.

This book brings to municipal engineers a keener realization of their part in, and responsibility for, the constructive work of city planning as well as city building. It is written with the idea that the fundamental problems of city planning are of an engineering nature, and devotes itself almost entirely to that aspect of the subject.

xv + 423 pages. 6 by 9. Profusely illustrated. Cloth, $3.50 net



Parks and Park Engineering

By William T. Lyle, Professor of Municipal Engineering at Lafayette College

The magnitude of the park movement in America is only beginning to be appreciated. This book is prepared principally for the benefit of the young and inexperienced engineer of construction. It will also be found useful to members of newly formed park associations and commissions.

viii + 130 pages. 6 by 9. 38 figures. Cloth, $1.25 net.

Municipal Engineering Practice

By A. Prescott Folwell, Editor of Municipal Journal, etc.

Treats at greater or less length all those matters which enter into the work of the city engineer, with the exception of sewerage, water supply and street paving, which are thoroughly taken up in other texts. Points out a practical way to a city efficient, healthful and economical.

xi + 422 pages. 6 by 9. 113 figures. Cloth, $3.50 net.

The Modern Factory

Safety, Sanitation and Welfare. By George M. Price, M.D., Formerly Director of Investigation, New York State Factory Commission, etc.

Gives a comprehensive review of the safety and sanitary conditions of factories and workshops as they are, and indicates the methods of safety, sanitation, efficiency and welfare of factories and workshops as they should be. The author has had special opportunities for studying industrial workers and conditions at first hand.

xx + 574 pages. 6 by 9. Fully illustrated. Cloth, $4.00 net.

10 DAYS FREE EXAMINATION

John Wiley & Sons, Inc., 432 Fourth Ave., N. Y. City.

Gentlemen:—Kindly send me for 10 days free examination the following books:

.....

.....

.....

It is understood that I am to remit the price of these books, or return them, carriage charges prepaid, within 10 days after their receipt.

Name.....

Address.....

(Indicate on the line above if you are a subscriber to American City; or give the name of the engineering society of which you are a member. If you are not a member of any society, kindly give a reference or state your position.) AC 6-18

Free Examination — No Cash In Advance

You can examine these books for 10 days, without sending cash in advance. This privilege is extended to subscribers to *American City*, or to members of any National engineering society. If you are not a subscriber or a member of any society, you can supply a reference, or indicate your position.

JOHN WILEY & SONS, Inc.

432 Fourth Avenue, New York

London: CHAPMAN & HALL, Ltd.

Montreal, Canada — Renouf Publishing Co.

Manila, P. I. — Philippine Education Co.

REGISTERED
THE MARK OF QUALITY — ECONOMY — IT PROTECTS THE USER
U. S. PAT. OFFICE

Drawing Tables and Filing cases in stock for immediate shipment.

Style No. 0, No. 1, No. 2
With tool tray and frame, and adjustable top.

ECONOMY TABLES MEAN ECONOMY IN EVERYTHING

Economy filing cases contain the most drawer space of any sections made.

Economy Dust Proof sections, for vault use, equipped with dust proof doors, keep tracings and blue prints free from dust, even when filed for years.

ECONOMY TABLES AND CASES ARE MADE IN WOOD OR STEEL

Write for Catalog

Economy Drawing Table Company

Adrian Michigan

Used in All Branches of the Service—

By Officers, Privates and Civilians

THE Parker Self-Filling Fountain Pen is SAFETY-SEALED. No holes in the wall for ink to get out to soil person or uniform. Carry it flat, right-side up—any position, without danger of leaking.

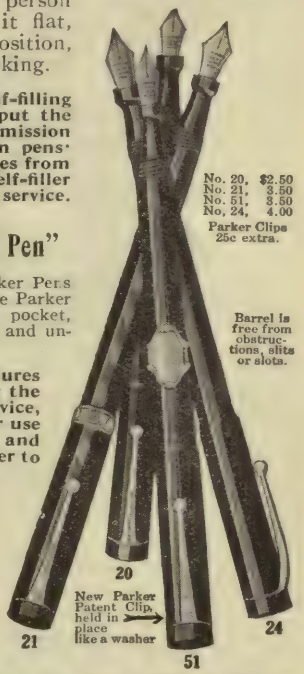
Injury to the self-filling mechanism does not put the PARKER out of commission as with other fountain pens· it automatically changes from a self-filler to a non-self-filler without interruption of service.

"The Pocket-Level Pen"

The Parker Clip (for Parker Pens only) brings the top of the Parker Pen to the level of the pocket, avoiding protruding pens and unsightly, bulging pockets.

The same exclusive features which make the Parker the favorite in the Service, make it the best pen for use in the home, office and school. Ask your dealer to show you the different styles.

PARKER INK TABLETS, for use in place of fluid ink, box of 36 for 10 cents.



PARKER PEN CO.
Mill St., Janesville, Wis.
New York Retail Store
Woolworth Building

PARKER
LUCKY CURVE
SAFETY-SEALED
FOUNTAIN PENS

Cemcoat

The Enamel-like Wall Coating

Cemcoat is furnished in either Gloss or Flat.
Cemcoat has the combined virtues of enamel and paint.
It presents a tile-like finish.
It is washable, sanitary and durable.
Cemcoat should be used for all municipal buildings such as Schools, Bath Houses, Police Stations, Jails, etc.
Particularly adapted for safety lines on pavements.

Write for literature, color card, testimonials, etc.

Department 27

L. SONNEBORN SONS, Inc.
264 Pearl Street, New York

SANITATION

While our "CANCO" garbage can in point of appearance and strength of construction is without a peer, yet our equipment—the most comprehensive in the country—is such that we can make any desired sort of garbage container.

TRADE CANCO MARK

AMERICAN CAN COMPANY

NEW YORK

Chicago Toledo San Francisco

With Offices in All Large Cities

LAPIDOLITH

TRADE MARK

For All Concrete Floors

The concrete floors in your water-works, fire-houses, filtration plants, pump stations, etc. need Lapidolith to make them hard as granite—dustproof, waterproof and resistant to the action of most chemicals. Lapidolith should be used on all concrete floors, old or new. Results are guaranteed.

Used by leading industrial plants in every line in every city.

Write for literature, testimonials and free samples.

Department 27

L. SONNEBORN SONS, Inc.

264 Pearl Street, New York

Every Official and Engineer

Should Have Our Catalogs

We are always glad to send to city and town officials and engineers copies of our catalogs describing

SPRACO

systems for aerating water, washing air, sprinkling parks and gardens, applying bituminous road binders, and for cooling condensing water for power plants.

Write today for the catalog in which you are likely to be interested.

SPRAY ENGINEERING CO.

93 Federal Street Boston, Mass.

CLEAN YOUR CATCH BASINS WITH THE OTTERSON AUTO-EDUCTOR

It's the most economical and practical method

Cleans catch basins in from four to twenty minutes at a saving of at least 50% in costs.

WRITE FOR BOOKLET

THE OTTERSON AUTO-EDUCTOR CO.

817 Fairbanks Bldg., Springfield, Ohio

Valuable Books For City Officials

A New Municipal Program

Edited by Clinton Rogers Woodruff

This book covers in detail the model city charter administrative organization, city planning, the fra chise policy, the council, business management for city courts, municipal home rule, the short ball principle, etc.

(*National Muni.ipal League Series*) **$2.00 net.**

The City Manager

By Harry Aubrey Toulmin, Jr.

A complete study of the new form of municipal government in charge of one city manager, which h been adopted in many cities of the south and west.

(*National Municipal League Series*) **$2.00 net.**

Excess Condemnation

By Robert E. Cushman

Discussing the right of the city to condemn land for parks, for public buildings, or for individual ente prises. A new and important question of municipal government.

(*National Municipal League Series*) **$2.00 net.**

City Planning

Edited by John Nolen

Covers the subject exhaustively from every angle. The most authoritative work on city planning.

(*National Municipal League Series*) **$2.00 net.**

Water Supplies

By Eric K. Rideal

A handbook for the use of local and municipal authorities discussing water supplies, their purificatio filtration, and sterilization.

(*National Municipal League Series*) **$3.00 net.**

The Budget

By Rene Stourm

This is a translation of the last edition of Professor Stourm's famous French work on budget maki containing the most recent changes in budgetary history and ideas.

(*Published for the Institute for Government Research*) **$3.75 net.**

Principles Governing the Retirement of Public Employees

By Lewis Meriam

This study deals with the whole subject of public policy governing the establishment of pension systen

(*Published for the Institute for Government Research*) **$2.75 net**

A Handbook of Municipal Accounting

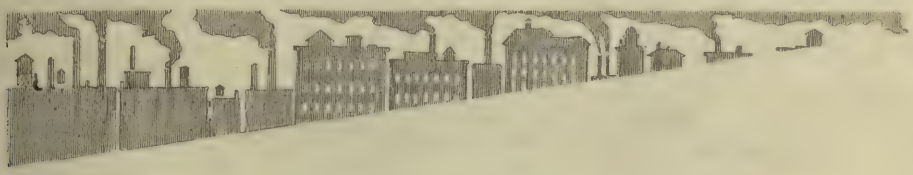
This book, prepared for the Metz Fund of the New York Bureau of Municipal Research, is a simple position of a scientific system of accounting and reporting for municipal utilities.

32 folders and many tables. $2.25 net.

AT ALL BOOKSELLERS THESE ARE APPLETON BOOK

Publishers

D. APPLETON & COMPANY, 35 West 32nd Street, New Yor



To Reach the Builders of Cities

YOU who advertise in "THE AMERICAN CITY" are presumably interested in reaching the men who make the cities. The men who make the cities are the live men in the cities and the live men in the cities are Rotarians, so naturally you want to reach Rotarians.

There are 37,000 of them and they are the leading business and professional men in 400 principal cities of the United States, Canada, Great Britain and Ireland; also Havana, Cuba. They are all affiliated together in a splendid organization known as the International Association of Rotary Clubs—an organization that has done much to put the Golden Rule into everyday use and to bring about a better understanding of the word SERVICE.

Rotarians are intensely interested in civic affairs and are becoming a powerful factor in the communities in which they live and do business. Rotarians represent an average annual income of better than $10,000 each and are in a position to influence the spending of millions of dollars annually for business, civic and domestic requirements.

You can reach all of these men through their own magazine, THE ROTARIAN—the Magazine of Service. Sample copy cheerfully sent on request. Write today for advertising rates and further information to

Frank R. Jennings, Advertising Manager

THE ROTARIAN

The Magazine of Service

Room 1009—910 Michigan Ave., Chicago, Ill.

The Noiseless Typewriter

Increases productive power by giving the mind a fair chance.

Hence at a time of world crisis it is the helpful servant of those who with intense effort are bending their energy to accomplish great results.

Readers of this Magazine will be interested to learn that the Noiseless Typewriter is used exclusively in the office of the American City.

Send for literature and an impressive list of users; or better still, ask for a demonstration and test at your own office.

The Noiseless Typewriter Company

253 BROADWAY, NEW YORK

Other Offices in

CHICAGO
PHILADELPHIA
BOSTON
DETROIT
CLEVELAND
SAN FRANCISCO
LOS ANGELES
and MONTREAL

Expert Advice and Service *for* Park Departments

Do you know what your costs are?
Do you know whether you are getting value for your money?
Would you like system and business method put into effect?
Let me tell you how to do this and get the most out of your park system.
This is a real service by expert and skilled persons.
We will put business methods into park maintenance and development. We will show you how to save money and get increased results.

Write for Detailed Information

Benjamin E. Gage
30 N. La Salle St. Chicago, Ill.

BENCHES AND SWINGS FOR Parks and Playgrounds

MADE IN ALL GRADES, STYLES AND SIZES

Write for Illustrated Material

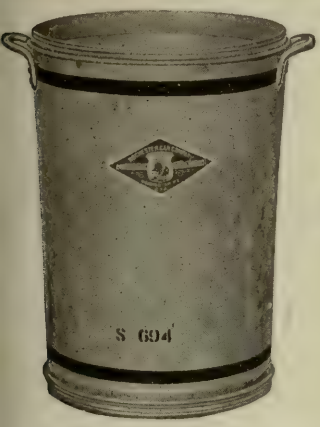
NOLL BROTHERS, MFRS.
Bausman, Lancaster Co. Penn.

HEALTH Exhibits Models Lantern Slides

GLASS HEAD MAP PINS
For City Record Maps
Complete Samples, 25 Cents

EDUCATIONAL EXHIBITION CO.

Custom House St. Providence, R. I.

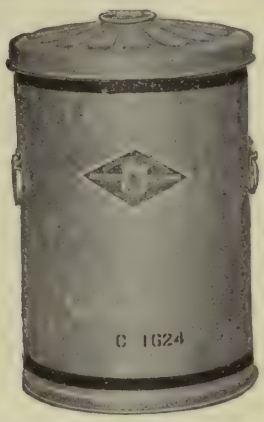


City Requirements

"IRON HORSE BRAND"

All Kinds of Ash, Garbage, Rubbish and Street Cans

QUALITY, LIKE CHARACTER, HAS A STANDARD



ILLUSTRATIONS SHOW A FEW OF OUR STYLES NOW IN USE IN A GREAT MANY CITIES AND TOWNS.

Cans Our Specialty

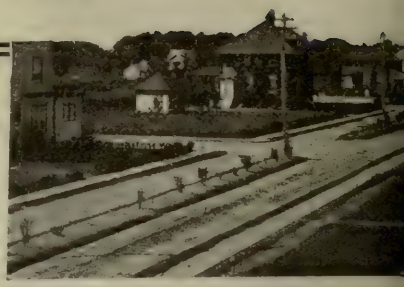
Prompt Shipment

Write for Catalogue and Prices

Manufactured by

ROCHESTER CAN CO.
Rochester, N. Y.

Shade Delivered With The Trees



3 to 5 years or more according to size saved over small saplings. We take the risk during their early tender life and you get the benefit.

We guarantee good trees of substantial growth and will replace any one that fails to thrive. We could not afford to make this offer if we did not know the good roots of trees that we furnish.

The value and benefit of good healthy shade trees in streets, parks, etc., as shown in the picture below are greatly appreciated and considered one of the most important municipal improvements.

Don't leave your streets barren and uninviting like the above. With a small outlay of money make your city attractive and a desirable place to live in.

Write today for literature on the subject.

Remember Hick's Trees are tall, straight and bushy and our 65 years in the business is a guarantee of quality.

HICKS NURSERIES

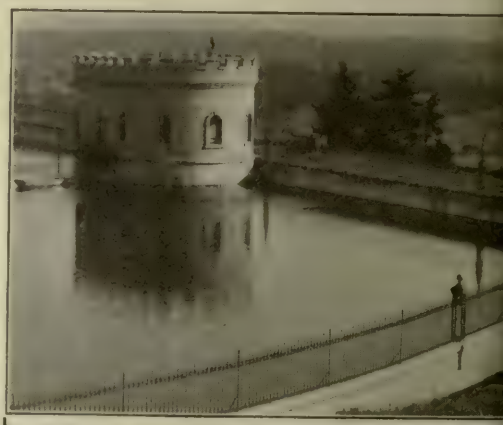
Westbury Long Island

UNIVERSALLY ADOPTED

THE SHAWNEE TRIPLE

"The Spring's the Thing"

SHAWNEE MOWER CO., 5 Beekman St., N. Y.



Butler Refuse Cans

are neat cans

The collected refuse in Butler Cans doesn't show up before your eyes.

It is covered from view (see illustration). These cans are shipped "knock-down" thus saving big freight bills. Write for particulars.

The Butler Mfg. Co.
St. Anthony Falls Sta.
Minneapolis, Minn.

Also makers of "Rus-Pruf" corrugated culverts with B.M.C. Wings

STEWART IRON FENCE

"The Standard of the World"

beautifies and protects public property economically, permanently, satisfactorily. The fencing of reservoirs at Chattanooga, Tenn., Fort Thomas, Ky., Butte, Mont., and pumping stations at New York City and Seattle, Wash., are typical Stewart installations.

Stewart's Iron Fence and Gates for hospitals, schools, parks, playgrounds and public buildings. Write for big illustrated catalog.

THE STEWART IRON WORKS CO.
(Incorporated)

527 Stewart Block Cincinnati, O.

Directory of Nurseries and Seedsmen

Thorburn's

1917 Catalog

A very large volume of Thorburn Seeds are furnished for parks and cemeteries.

Write us for catalog and let us know your requirements: and your letter will have our prompt and careful attention.

J. M. Thorburn & Co.
53 Barclay Street NEW YORK

MEEHAN

Nursery Stock

Needs no recommendation. It is known throughout the American Continent

225 acres

ORNAMENTAL TREES, SHRUBS, EVERGREENS and HARDY PLANTS

Spring catalog now ready

THOMAS B. MEEHAN CO.
Wholesale Nurseryman
DRESHER (Near Philadelphia) PA.

Burpee's Seeds Grow

BURPEE'S ANNUAL for 1918, the Leading American Seed Catalog contains the latest and most reliable information about "The Best Seeds that Grow." 216 pages with 103 colored illustrations. It is sent free to those who write for it. Write for your copy today. A post card will do.

W. ATLEE BURPEE & CO. Seed Growers PHILADELPHIA

Nurserymen, Florists and Seedsmen

Everything for Parks, Cemeteries and Private Places. Largest general assortment in America. Personal inspection invited. Special prices on car load lots. Switch from New York Central Ry. to our grounds. 1200 acres. Pleased to quote on your want list.

THE STORRS & HARRISON CO.

Landscape Dept.
627 Engineers Bldg.,
Cleveland, Ohio

Painesville,
Ohio

NORWAY MAPLES

The best shade tree for street and park purposes — especially in northern latitudes and in smoky and dusty localities — is the Norway Maple.

Norway Maples such as the one depicted transplant with the minimum of setback and give immediate effect. We have several thousand trees just as good as this one. Many are better.

All are sound, healthy trees with straight, smooth, sturdy trunks, heavy masses of fibrous roots, and well-developed, bushy heads. They run 14 to 16 feet tall and in two calipers — 2 to 2½ inches and 2½ to 3 inches.

Trees of this size pack about 500 to 700 to the carload. Write us for prices on the quantity you can use. Special prices on carload lots.

We also grow a general line of trees, shrubs and evergreens for street and park planting.

Framingham Nurseries
FRAMINGHAM — MASSACHUSETTS

Willadean Nurseries

Offer a very complete line of Trees, Shrubs and Ornamental stock for all kinds of Landscape work. Send your want lists for estimate. Trade list on application.

THE DONALDSON CO.
Box 22, SPARTA, KY.

TREES SHRUBS EVERGREENS

800 ACRES

AMERICAN NURSERY CO.
Singer Building, New York
NURSERIES
Springfield, N. J. Flushing, L.

BOBBINK & ATKINS

World's Choicest Nursery and Greenhouse Products

We invite interested parties to visit our Nursery and inspect our Trees, Shrubs, Evergreens, Herbaceous Plants, Roses and other stock of which we have more than 300 acres.

OUR ILLUSTRATED GENERAL CATALOG No. 22 describes the high class Nursery material we grow.

SPECIAL PRICES quoted on lists for Public Parks.

Nurserymen, Florists and Planters, Rutherford, New Jersey

W. & T. SMITH COMPANY

NURSERY STOCK AT WHOLESALE

Send for Catalogue and Price List

GENEVA NURSERY, Geneva, N. Y.

Lewis & Valentine Co.
Roslyn, N. Y.
The World's Largest Movers of Big Trees.

Ornamental Trees, Shrubs, and Hardy Perennials

A complete stock.
Quality unexcelled.
Send for price list.

HENRY KOHANKIE & SON
Painesville, Ohio

Norway Maples

are unrivalled for shade and for landscape effects. We have a large stock of splendid specimens that will mature rapidly into towering round-topped trees, with clean, sturdy trunks. Also a complete stock of ornamentals. Over 2500 acres in nursery stock.

Write for 1918 Catalog and prices.

Harrisons' Nurseries, BOX 70, Berlin, Md.

Dreer Specialties

Decorative Plants, Roses, Hardy Perennials, Hardy Shrubs, Hardy Climbers, Box Woods and Bay Trees, Hedge Plants, Aquatics, etc. We are large producers of above and many other plants suitable for Park use.

Write for Catalogue.

HENRY A. DREER, Philadelphia, Pa.

FOR *SAFE* TREE SURGERY—

for Tree Surgery that is scientifically accurate and mechanically perfect—for Tree Surgery that saves trees without guessing and experimenting—come to headquarters.

The Davey Tree Expert Co., Elm St., Kent, Ohio

Branch offices with telephone connections: 225 Fifth Ave., New York. 2017 Land Title Bldg., Philadelphia. 450 McCormick Bldg., Chicago.

Permanent representatives in all principal cities.

Davey Tree Surgeons

ENTERPRISE PROTECTIVE FENCE

Keeps out undesirable persons. Beautifies surroundings and increases values. Does not obstruct fine views.

protects and beautifies

Schools	Public Bldgs.
Hospitals	Cemeteries
Parks	Asylums
Estates	Etc., Etc.

Send for Illustrated Catalog explaining offer to make free blue-print of Enterprise fencing for any property.

ENTERPRISE IRON WORKS 1161 E. 24th St., Indianapolis

Specialists for 33 years in All-Iron and Iron-and-Woven-Wire protective fencing

AMERICAN-GROWN TREES

OUR stocks of trees, shrubs and plants are not curtailed by the stoppage of foreign shipments. We sell Andorra-grown.

Catalog on request.

ANDORRA NURSERIES Wm. Warner Harper, Prop.

Box 20, Chestnut Hill, Phila., Penna.

Patented Sprinklers of Distinction from the Manufacturer to You

Guaranteed deliver uniformly more water over greater area at less cost than other sprinklers. WILL NOT WEAR OUT, leak or puddle. Operate any position. Adopted by most exclusive hotels, golf clubs, parks, cemeteries, nurseries. Will send to such people on approval. No deposit required until approved. CAN YOU BEAT THAT? State size of hose, working pressure and purpose desired. We also have latest inventions in adjustable heads for underground systems and adjustable hose sprays. Write for illustrated catalog.

W. A. BUCKNER, 1051-T-Street, Fresno, Cal.

ODORLESS STAINLESS

DUSTOLINE FOR ROADS

TRACKLESS (TRADE MARK) TRANSPARENT

THE DUSTOLINE FOR ROADS CO., Summit, N. J., Phone 33

Has none of the objectionable features of the black asphaltic oils or tar preparations

City Planning in Flesh and Blood

If you are interested in planning for the future of your city in terms of better health, less poverty, better education, more wholesome recreation, happier and more contented workers, closer cooperation between public and private welfare agencies;

If you want to keep in touch with the most authentic news and the most authoritative opinion from every field of work for the common welfare;

You will find enjoyable, helpful and inspiring the attractively printed, graphically illustrated and carefully edited weekly issues of **The Survey.**

Send three dollars now in check or greenbacks for a year's subscription—52 issues.

THE SURVEY

JOURNAL OF SOCIAL WORK.

112 East 19 St. Room 1204 New York City

Paul U. Kellogg, Editor.

Edward T. Devine, Graham Taylor, Jane Addams, Associate Editors

Expert Advice is a Real Economy

DIRECTORY OF CONSULTING ENGINEERS CONTRACTORS LANDSCAPE ARCHITECTS

Effective Construction Requires Wise Planning

Albright & Mebus
CIVIL ENGINEERS
Town planning and municipal improvements, parks, drainage, sewerage and sewage disposal.
008 LAND TITLE BUILDING
PHILADELPHIA

ALLENTOWN ESTING LABORATORY
Inspecting and Testing Engineers and Chemists.
Cement and Aggregates, Steel, Paving Materials, Water Analyses
RNEST B. McCREADY, Director
373-77 Linden St., Allentown, Pa.

ohn W. Alvord and Chas. B. Burdick
CONSULTING ENGINEERS
Reports, Investigations, Plans and Specifications for Water Supplies, Water Purification, Water Power, Sewerage, Sewage Disposal.
ARTFORD BLDG. CHICAGO

HEFFIELD A. ARNOLD
Landscape Architect
Land Subdivisions
City Parks Institution Grounds
Private Estates
Bromfield St. Boston, Mass.

RNOLD & TRIPP
Landscape Architects
City Planning, Land Subdivisions, City Parks, Institution Grounds, Private Estates
Guardian Bldg., Cleveland, Ohio

Kansas City, Mo. Interstate Bldg.
LACK & VEATCH
Consulting Engineers
Sewerage, Sewage Disposal, Water Supply, Water Purification, Electric Lighting, Power Plants, Valuations, Special Investigations and Reports.

. H. BLANCHARD
Am. Soc. C. E. M. Can. Soc. C. E.
CONSULTING HIGHWAY ENGINEER
BROADWAY and 117th STREET
NEW YORK CITY

Kansas City, Mo. Interstate Bldg.
Burns & McDonnell
CONSULTING ENGINEERS
Appraisals, Rate Investigations, Expert Testimony, Water Works, Sewerage, Lighting.
Clinton S. Burns R. E. McDonnell

JAMES M. CAIRD
Assoc. Am. Soc. C. E.
CHEMIST and BACTERIOLOGIST
OFFICE AND LABORATORY
271 RIVER STREET TROY, N. Y.
Water Analysis and Tests of Filter Plants

CHESTER & FLEMING
HYDRAULIC AND SANITARY ENGINEERS
Water Works, Water Filtration, Appraisements and Reports, Sewerage, Sewage Disposal, Operation of Properties.
UNION BANK BLDG. Pittsburgh

LOUIS S. COLE
LANDSCAPE ARCHITECT
14 E. Jackson Blvd.
CHICAGO, ILL.
Specialist in City Planning, Playgrounds, Parks and Cemeteries.

WILLIAM E. CULLEN
Landscape Architect and Designer
Ornamental Gardening, Beautifying Homes, Rural Districts, Towns, Schools, Yards, Parks and Cemeteries.
BOULDER, COLORADO

The Duluth Engineering Co.
W. B. PATTON, Mem. Am. Soc. C. E., Ex-City Engineer Duluth, Manager
MUNICIPAL ENGINEERS
Waterworks, Sewerage, Electric Lighting, Town Planning.
Suite 612-616 Palladio Building
DULUTH, MINN.

F. A. Dunham-Clarin Co.
CIVIL ENGINEERS
Municipal Engineering
Roads Sewers Supervision
Surveys
Topographic Title
Land Subdivisions
109 Park Ave. Tel. 610
PLAINFIELD, N. J.

Analyses Tests Inspections
Consultations Reports Specifications
WALTER H. FLOOD
Chemical Engineer
PAVING AND ENGINEERING MATERIALS
Municipal Work a Specialty
326 River Street, CHICAGO

Fuller & McClintock
CONSULTING HYDRAULIC ENGINEERS and SANITARY EXPERTS
170 Broadway, New York City
George W. Fuller James R. McClintock
Jesse K. Giesey

Gannett, Seelye & Fleming
CONSULTING ENGINEERS
Civil, Hydraulic, Sanitary, Electrical, Municipal Problems
204 LOCUST ST., HARRISBURG, PA.

SAMUEL A. GREELEY
64 W. Randolph St., Chicago
Hydraulic and Sanitary Engineer
Sewerage, Sewage Disposal, Water Supply and Filtration, Garbage and Refuse Disposal, Treatment of Industrial Waste, Supervision of Operation.

JOHN H. GREGORY
Consulting Hydraulic Engineer and Sanitary Expert
170 Broadway, New York City
Reports, Investigations, Plans and Specifications for Sewerage, Sewage Disposal, Water Supply, Water Purification and Garbage and Refuse Disposal.

New York City 2 Rector Street
A. E. HANSEN
Hydraulic & Sanitary Engineer
Design & Supervision of Construction
Sewerage Water Works
Sewage Disposal Water Purification
Drainage Water Works
Garbage Disposal Valuation
Water Analyses

James C. Harding,
Consulting Engineer and Sanitary Expert.
Water Supply and Purification. Refuse Disposal. Sewerage and Sewage Disposal. Investigations of Epidemics. Water Works Valuations. Supervision of Construction and Operation.
New York City, 170 Broadway

Sid. J. Hare — Fellow A.S.L.A.
S. Herbert Hare — Member A.S.L.A.

HARE & HARE
Landscape Architects
604 Gumbel Bld., Kansas City, Mo.
Plans and Reports for Parks, Park Systems, Land Subdivisions, Estates, Municipal Improvements, Cemeteries

HAZEN, WHIPPLE & FULLER
CONSULTING HYDRAULIC and SANITARY ENGINEERS
WATER SUPPLY and SEWERAGE
Allen Hazen — G. C. Whipple
W. E. Fuller — F. F. Longley
C. M. Everett — L. N. Babbitt
H. Malcolm Pirnie
30 East 42d St. NEW YORK CITY

Arthur H. Helder
Landscape Architect
418 Reliance Bldg. Kansas City, Mo.

Rudolph Hering, D.Sc.
Consulting Engineer
170 Broadway New York
WATER SUPPLY, SEWAGE AND REFUSE DISPOSAL
Over 40 years active practice in United States and Canada

J. Wallace Higgins
Assoc. M. Am. Soc. C. E.
CIVIL AND LANDSCAPE ENGINEER
Municipal Engineering, Sewerage, Parks, Cemeteries, Subdivisions, Topographic Surveys, Title Surveys, Estimates, Supervision
52 Vanderbilt Avenue, New York

Charles C. Hopkins
M. Am. Soc. C. E.
Consulting Hydraulic and Sanitary Engineer
349 Cutler Bldg., Rochester, N.Y.
Water supply and purification. Sewerage. Sewage and wastes disposal. Municipal engineering. Plans, reports, estimates, supervision. Expert testimony and appraisals.

MUNICIPAL PROBLEMS
Budget Making—Salary Standardization—Centralized Purchasing—Cost Accounting—Public Utility Service and Rate Studies
J. L. JACOBS & COMPANY
Engineers—Cost Accountants—Municipal Experts
Monadnock Building Chicago

The
JENNINGS-LAWRENCE CO.
CIVIL AND MUNICIPAL ENGINEERS
511-12 Hartman Bldg.
COLUMBUS OHIO

GEORGE A. JOHNSON
M. Am. Soc. C.E.
Consulting Hydraulic Engineer and Sanitary Expert
150 Nassau St., New York.
Water Supply and Purification. Sewerage and Sewage Disposal. Plans and Reports. Supervision of Construction. Valuations. Improved Operation of Existing Plants. Investigation of Epidemics.

MORRIS KNOWLES
Consulting, Sanitary and Hydraulic Engineer
Municipal, Community and Civic Problems
Pittsburgh, Penna.

CHARLES W. LEAVITT
CITY PLANNING
and all branches of
CIVIL and LANDSCAPE ENGINEERING
220 Broadway NEW YORK

J. L. LUDLOW
Winston-Salem, N. C.
Consulting Municipal Engineer
Sanitary and C ·lc Expert
Water Supplies, Sewage Disposal, Reports, Plans, Valuations, Appraisals. Efficiency and Economy Studies, Physical and Financial Reports on Public Utilities in Southern Cities. Advice in Municipal Sanitation and Public Health. Interviews by appointment in Eastern Cities.

THOMAS MEEHAN & SONS
Practical Landscape Gardeners and Engineers
Especially qualified for work involving use of hardy plants. Large estate developments: country clubs. Plans executed.
"We know plants"
6703 Chew Street, Germantown, Phila., Pa.

HUGH C. MITCHELL
GEODETIC ENGINEER
CONSULTANT ON CITY TRIANGULATION PRECISE LEVELS, AND TOPOGRAPHIC SURVEYS.
601 West 32d Street
AUSTIN, TEXAS

POLLOCK AND TABER
CONSULTING ENGINEERS
Pavements, Highways, Water Supply, Drainage, Sewerage and Sewage Disposal
Designs, Specifications and Supervision
Clarence D. Pollock } Members
George A. Taber } Am. Soc. C. E.
Park Row Building, New York City

Alexander Potter, C. E.
Hydraulics, Sanitation, Concrete Structures Designed Executed.
50 Church Street, New York
(Hudson Terminal) Tel., Cortlandt 5501

Clyde Potts
30 CHURCH ST. NEW YO
Civil and Sanitary Engineer
Sewerage and Sewage Disposal Wo Hydraulics, Water Works, Filtrati Reports, Plans and Estimates.

VICTOR A. RIGAUMONT
CITY PLANNER
Ferguson Bldg., Pittsburgh, Penn
INDUSTRIAL HOUSING
MUNICIPAL BUILDINGS
PARKS AND PLAYGROUNDS
Thoroughfares—Transportation

LOUIS E. STANDE
Certified Public Accountant
Municipal and Public Utility Account Rate and Capitalization Cases
200 Fifth Avenue, New Yor
Chief Acct.—Bd. of Ed. 1899-1907
Acct—Pub. Service Com. 1908-1912
Chief Auditor—Dept. Water Supply, and Electricity, 1912-1916.

Sewage Disposal Plan
for Country Residences, Factories and In tutions. Standard Plans and Specificati including description and estimate of of modern sewage treatment.
Blue Prints, 12 sheets, 9" x 12", $5.00
LeRoy K. Sherman, Sanitary Engin 1102 Tacoma Bldg., Chicago.

Henry W. Taylo
HYDRAULIC AND SANITAR ENGINEER
26 Cortlandt St., New Yo
100 State Street, Albany, N.Y.
Water Supply, Water Purification, Sew age, Sewage Disposal, Reports, Plans, S pervision of Construction and Maintena

L. SCOTT TWOGOO
Civil and Sanitary Enginee
1514-15 Bank of Commerce and Trust Bl
MEMPHIS, TENN.
Water Supply, Water Purification, Sewer Systems, Sewage Disposal, Reinforced Co crete Structures, Municipal Improvemen Operation of Purification Plants, Laborato for Analysis of Water and Sewage.

Waddell & Son
Consulting Engineers
Movable Bridges, Reinforced Concrete a Steel Structures, Elevated Railways, Repor Checking of Plans, Advisory Services a Appraisal.
Main Office, Kansas City.
New York Office, 35 Nassau Street.

WARREN ENGINEERING CO
Specializing in Municip Water Supply and Purificatio Sewerage and Sewerage Di posal, Paving.
DECATUR ILLINOI

MARK WOLFF
Certified Public Accountant

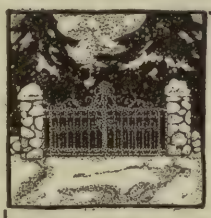
Consultant
Rate & Capitalization Cases
Gas, Electric & Water Utilities
1328 Broadway
New York City
Municipal Accounting

Shall we send you our
Selected List of Municipal and Civic Books?
THE CIVIC PRESS
87 Nassau Street New York

Did you see Page 88? Turn To It Now!

SCOFIELD ENGINEERING COMPANY, PHILADELPHIA
Consulting Engineers
An organization of thoroughly trained experts with a wide successful experience in
PUBLIC SERVICE PROPERTIES, INDUSTRIAL AND TEXTILE PLANTS, REFRIGERATION, MUNICIPAL IMPROVEMENTS

BAKER
Road and Street Products
Everything Guaranteed
Baker Dustless Pick-up Sweeper
Baker Street Carts and Can Carriers
20th Century Horse Drawn Snow Plows
20th Century Road Graders and Drags
Baker Portable Wagon Dump Boxes
Maney Self loading 4-wheel Scrapers
48 page catalog on request
THE BAKER MFG. CO.
503 Stanford Ave. Springfield, Illinois



The ornamental iron fences and gates of parks should be protected from rust and corrosion by
DIXON'S SILICA GRAPHITE PAINT
It is both ornamental and the lowest-cost-per-year paint because it gives longest protection. Write for Booklet No. 107-B and records of long service.
Made in JERSEY CITY, N. J., by the
JOSEPH DIXON CRUCIBLE CO.
Established 1827

ORANGEBURG FIBRE CONDUIT

Book "D" on request
THE FIBRE CONDUIT CO.
Orangeburg, N. Y.
New York Boston Chicago San Francisco

Reilly's Improved Permanent Creosote Oil
Patented
Permanently protects wood block pavements.
Prevents bleeding and bulging.
Solves all paving block troubles.
Specify it in your contracts.
Republic Creosoting Co., Indianapolis, Ind.
Plants: Indianapolis Minneapolis Mobile Seattle Norfolk

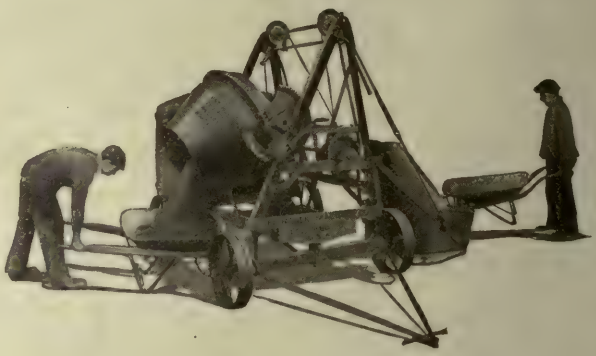
We Can Do The Same For You!
We are Consulting Engineers for Municipalities.
We designed, built and operated the Cleveland Municipal plant. Its maximum rate is 3 cents per K. W. hour.
We represent cities in negotiations with the Utility Corporations.
We prepare valuations and represent cities before the State Commissions in rate cases for Electric Light, Gas, Telephone, Water Works and Railway Fare Cases.
Write for Printed Matter
F. W. BALLARD & CO.
Engineers
Swetland Building Cleveland, Ohio

Jaeger Concrete Mixer

Used by progressive municipalities and contractors.

Especially adapted to "speed-up" work.

Write us for detailed information.



THE JAEGER MACHINE CO.

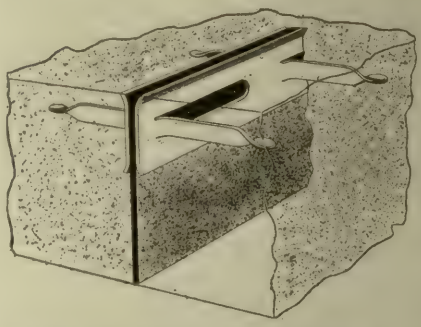
215 W. Rich Street :: Columbus, O.

The TAYLOR

PORTABLE STEEL DERRICK with Gondola Car Attachment for HANDLING PIPE or other heavy material from gondola cars.

Catalog illustrating the Taylor Portable Steel Derricks furnished on application.

TAYLOR PORTABLE STEEL DERRICK CO.
213 W. Grand Ave., Chicago, Ill.



BAKER IMPROVED ARMOR PLATE

Protect the expansion joint of the concrete pavement. Keep it from breaking down under traffic by specifying steel protected joints.

Baker *Bevel Edged Plate,* easy to install and will wear down with the pavement.

Ask about Baker Armor plates and Installation System.

THE R. D. BAKER CO., DETROIT, MICH.

Chapman Valves and Accessories

Everything for Water Works and Sewage Disposal but the Pipe.

Corporation and Curb Cocks.

Goosenecks—made up with Anderson couplings which eliminate wiped joints.

Gate Valves Sluice Gates Hydrants

Catalogue containing valuable information free on request.

Write Today

THE CHAPMAN VALVE MFG. CO.
INDIAN ORCHARD, MASS.

GRAVITY **FILTERS** PRESSURE

WATER SOFTENING PLANTS AND HYPOCHLORITE APPARATUS

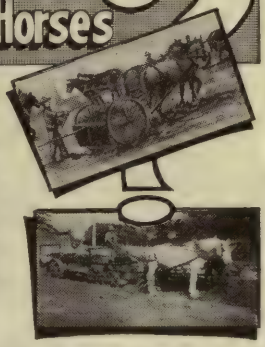
ALL VARIETIES OF

CHEMICAL FEEDING DEVICES

Write for Bulletin 17-3

THE NEW YORK CONTINENTAL JEWELL FILTRATION CO.
NUTLEY, N. J.

4 Men And 8 Horses Or 1 Man And 4 Horses



WHICH WAY OF HANDLING DIRT IS YOUR WAY?

Have you the **right** equipment to move dirt **fast?**

Scarcity and high price of labor makes old-fashioned methods too costly now a days. **You can't afford to move dirt with wagons and a shovel gang or with wheel scrapers.** Stop wasting time and labor and losing profits—use modern methods.

Spaulding 2 In 1 Road Machine

Solves dirt-moving problems to your profit. Fastest and most economical dirt-handling outfit ever produced. **Cuts costs 50%. Handles dirt, sand, gravel, twice as fast as any other known method with same crew. Loads 1½ yds. of dirt in 30 seconds.** One man and 4 horses operate machine—**move more dirt per day than four men and 8 horses with wheelers. No plowing necessary.** Dumps dirt in piles or spreads evenly.

Used by biggest contractors everywhere—endorsed by all users. **Write for complete information now.**

Address **Spaulding Mfg. Co**
Dept. 240
Grinnell, Iowa

The Index

(Classified)

appearing on page 88 and following is being used constantly by readers of The American City in securing information and favorable quotations.

Are You Using It?

ABSOLUTELY FIREPROOF

HOTEL CHELSEA

West 23rd St. At Seventh Ave.
NEW YORK CITY

500 Rooms EUROPEAN PLAN 400 Baths

Room with adjoining bath, $1.00 and $1.50; suites, parlor bedroom and bath, $3.00 and upward.

Club breakfast, 25c up; special luncheon, 50c up; table d'hote dinner, 75c up. Cafe attached.

To Reach Hotel Chelsea:

From Pennsylvania Station, 7th Ave. car south to 23rd St.

Grand Central, 4th Ave. car south to 23rd St.

Lackawanna, Erie, Reading, Baltimore and Ohio, Jersey Central and Lehigh Valley R. R. Stations, take 23rd St. crosstown car to Hotel Chelsea.

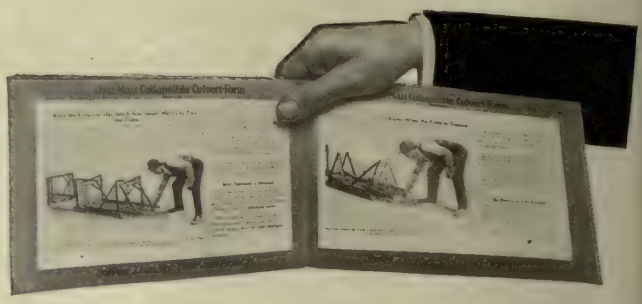
Principal Steamship Piers, foot West 23rd St., take 23rd St. crosstown car.

Write for Colored Map of New York

Cutting the Cost of Culverts

Means and methods of accomplishing these very desirable savings are described in the booklet shown herewith, which will be sent to any one without obligating him in the least.

This booklet is published *for distribution.* If you are interested directly or indirectly in culverts or culvert construction, it will be well worth your while to read this illustrated treatise on the subject, and we will be pleased to send it to you on request.



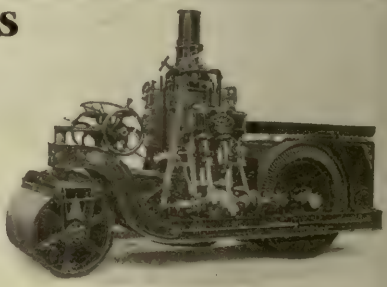
STORMS MFG. CO. 347 Monadnock Block CHICAGO

ERIE TANDEM PAVING ROLLERS

Includes everything that makes for the best in Road Rollers. They are strong, simple in construction—durable and economical and easy to operate. Our first roller built in 1887 is still doing its "bit."

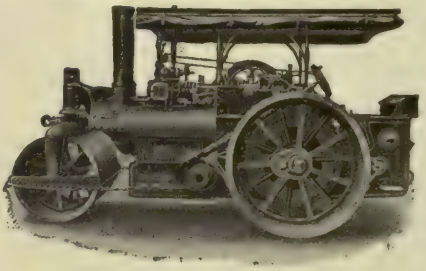
Erie Rollers are guaranteed against breakage or wear for 5 years.

Write for illustrated material.



THE ERIE MACHINE SHOPS ERIE, PA.

QUALITY MACHINERY



BUFFALO PITTS ROLLERS

Are purchased by discriminating buyers because of the many years of satisfactory service which they will render, the low repair costs and their general reliability.

ASK THOSE WHO OWN THEM

All sizes All Types Write for catalogue

Built only by

THE BUFFALO-SPRINGFIELD ROLLER COMPANY
SPRINGFIELD, OHIO

MOTOR TRUCK AND HORSE DRAWN

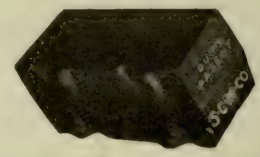
FLUSHERS—SPRINKLERS—OILERS

Also Flushing, Sprinkling and Oiling Units complete for mounting on trucks

E. D. ETNYRE & CO. : OREGON, ILL.

SOUTHERN CLAY MFG. CO.

James Building
CHATTANOOGA, TENN.



Annual Capacity:
Thirty Million Paving Blocks

Manufacturers of

WIRE-CUT-LUG BLOCKS
DUNN PATENT

KOLESCH Surveying INSTRUMENTS

and Accessories

are designed to meet the especial needs of Municipal Engineers and can be depended upon for reliable and lasting service.

The No. 7710 transit shown is a sturdy instrument and particularly well suited for road, street and sewer work. It is worth investigating.

We will be pleased to quote on your present needs.

TRADE MARK

KOLESCH & CO., 138 Fulton Street, New York

Littleford Tar Heaters

Many municipalities have found the "Littleford" a valuable and economical asset in Street Repair work.

Write for booklet.

LITTLEFORD BROS. 500 E. Pearl St., Cincinnati

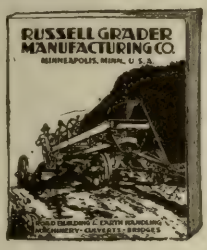
BUFF

ENGINEERING INSTRUMENTS

are the strongest, most accurate and longest-lived Instruments built. The close accuracy, high grade materials and superior workmanship have made the Buff the recognized standard. *Write for catalog No. 4.*

BUFF & BUFF MFG. CO. Jamaica Plains, BOSTON, MASS.

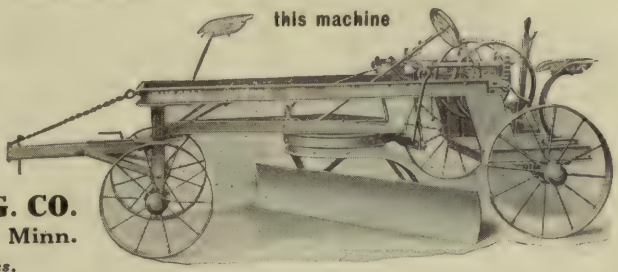
221 Lamartine Street — 231 N. Wells Street, Chicago, Ill.



Considering the most usual needs of towns and the purchase price; the horses and men required, the absence of repairs—considering all these—you can't go wrong buying—

this machine

Our 1918 CATALOG should be in your Business Library



RUSSELL GRADER MFG. CO.

Minneapolis Minn.

Representatives in Principal Cities.

Page 34 Shows How They Do It In Other Places

REPUBLIC FIRE HOSE

Fire chiefs generally recognize the superior wearing qualities of Republic Fire Hose, which has made good in the hardest kind of service.

Republic Rubber Corporation

Youngstown, Ohio

Purchasing Officials

will find valuable information on page 88. These suggestions have been a great help to others. Why not to you?

ATLANTIC PUMPING ENGINES

Send for Catalog

HAROLD L. BOND COMPANY, 383 W. ATLANTIC AVE BOSTON, MASS.

The Good Roads Catalogue

gives information about Oiling Machinery, Rock Crushers, Road Rollers, Road Graders, Street Sprinklers, Sweepers, Push Brooms, Can Carriers, Culvert Pipe, Road Drags and Street Castings.

Ask for a copy. It is free.

The Good Roads Machinery Co.
Kennett Square, Pa.

CONNERY'S NON-LEAKABLE WELDED
"HELD BY WELD" TAR AND ASPHALT KETTLES

COMBINATION HEATER AND DRYER

All Sizes and Styles.
Write for Specification.
Combination Heater and Dryer.
Separate yet combine One Fire so arranged to give required Heat.
Note the Improved Shut Off Door.
A Wonder for Repair Work.

Style "P"
10 Gallon Cap. Inside Pot lifts out, can be used for pouring Pot. Used by Highway Division Superintendents to patch small holes in road.

Stock Carried in Large Cities

STYLE "P"

Mfd. by CONNERY & CO. Inc., 2nd and Luzerne Sts., Philadelphia, Pa.

PENNSYLVANIA PORTLAND CEMENT

"One Source—One Mill—One Standard"

Every bag of Pennsylvania Cement, wherever obtained and for whatever purpose, has the same high quality required for government and public service work in which it is extensively used. Ask your dealer for Pennsylvania. If he cannot supply you, write direct to

Pennsylvania Cement Company, 30 East 42nd St., New York

When writing to Advertisers please mention THE AMERICAN CITY.

Every Road Needs

SOLVAY

Granulated

Calcium Chloride

To keep it clean, sanitary and free from dust. SOLVAY is a most efficient road binder, for it works down into the body of the road aiding the natural cementing of rock and soil. This causes the road surface to pack firmly, even under heavy traffic.

SOLVAY GRANULATED CALCIUM CHLORIDE is an odorless chemical salt which does not discolor the road surface, nor will it stain or corrode. Applied dry, it absorbs moisture from the air doing away with the constant expense of sprinkling. The low cost of maintenance is also an important feature.

The application of SOLVAY requires no skilled labor nor expensive apparatus. Two applications a season will keep a road surface in excellent condition the year 'round.

If you are interested in good roads at a minimum cost write for the "Solvay Road Book" mailed free upon request.

SEMET-SOLVAY CO.

410 Milton Ave. Solvay, N. Y.

BUY WAR SAVINGS STAMPS!

THE AUSTIN-WESTERN ROAD MACHINERY COMPANY

Chicago

are the largest builders—and builders of the largest line of Road Machinery in the World.

Our Line

Motor (Kerosene) Road Rollers
Motor Tandem Rollers
Horse Road Rollers
Gyratory Rock Crushers
Jaw Rock Crushers
Elevating Graders
Road Graders
Street Sweepers

Wheeled Scrapers
Drag Scrapers
Road Drags
Road Scarifiers
Road Plows
Street Sprinklers
Road Oilers
Dump Wagons

Our Branches

New York City
Columbus, Ohio
Atlanta, Ga.
Memphis, Tenn.
Boston, Mass.
Dallas, Texas
St. Paul, Minn.
San Francisco, Cal.
Los Angeles, Cal.
Salt Lake City, Utah
Portland, Ore.
Denver, Colo.

The Municipal Buyers' Guide

A classified reference index of advertisers in this issue of The American City

The alphabetical index of advertisers which follows this list (see page 98) will give you the page numbers of all advertisements, thus enabling you to secure the full address of the advertisers, as well as other information which may be of value.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 98

Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark.

Aerial Ladder Trucks.
Couple-Gear Freight-Wheel Co.

Air Compressors.
General Electric Co.
Modern Iron Works.
Water Works Equipment Co.
Worthington Pump & Mach. Corp.

Air and Gas Washers.
Spray Engineering Co.

Ambulances.
White Co., The.

Antoxide.
Harrisons, Inc.

Arc Lamps.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Armored Concrete Pavements.
Truscon Steel Co.

Asbestos.
Carey Co., Philip.

Asphalt.
Carey Co., Philip.
Pioneer Asphalt Co.
Standard Oil Co.
Warren Bros. Co.

Asphalt Machinery.
Casey-Hedges Co.
Connery & Co., Inc.
Erie Machine Shops
Littleford Bros.
Warren Bros. Co.

Automobile Fire Apparatus.
American-La France Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Couple-Gear Freight-Wheel Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
The White Co.

Automobile Lubricants.
Joseph Dixon Crucible Co.

Belt Dressing.
Joseph Dixon Crucible Co.

Blasting Supplies.
DuPont de Nemours & Co., E. I.

Blue Print Paper and Machines.
Kolesch & Co.

Books.
Appleton & Co., D.
Wiley & Sons, John.

Braces, Extension.
Bond & Co., Harold L.
Modern Iron Works.

Brass Goods.
Anderson Coupling & Fire Sup. Co.
Clark Co., H. W.
Modern Iron Works.
Smith Co., A. P.
Water Works Equipment Co.

Brick, For Paving.
Dee Co., Wm. E.
Metropolitan Paving Brick Co.
Southern Clay Mfg. Co.

Buses, Motor.
White Co., The.

Campaigns for Commercial Organizations.
American City Bureau.

Cans for Ashes and Garbage.
American Can Co.
Buffalo Municipal Equipment Co.
Butler Mfg. Co.
Newport Culvert Co.
Rochester Can Co.

Cast Iron Pipe.
Donaldson Iron Co.
Glamorgan Pipe & Foundry Co.
Lynchburg Foundry Co.
Massillon Iron and Steel Co.
U. S. Cast Iron Pipe & Fdry. Co.
Warren Foundry & Machine Co.
Zelnicker Supply Co., W. A.

Catch Basins.
Buffalo Municipal Equipment Co.
Casey-Hedges Co.
Clark Co., H. W.
Dee Co., Wm. E.
Modern Iron Works.
Odorless Sewer Basin Co.
U. S. Cast Iron Pipe & Foundry Co.

Catch Basin Cleaning Apparatus.
Otterson Auto-Eductor Co.

Caulking Machinery.
Smith Co., A. P.

Caulking Materials.
Leadite Co.
Modern Iron Works.
United Lead Co.

Cemcoat.
Sonneborn Sons, Inc., L.

Cement.
Pennsylvania Cement Co.

Cement Inspection.
Allentown Testing Laboratories.

Centrifugal Pumps.
Shone & Co.
Worthington Pump & Mach. Corp.

Certified Public Accountants.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark.

Check Valves.
Columbian Iron Works.

Chemical Analysis.
Allentown Testing Laboratories.

Chemical Engines.
American-La France Fire Eng. Co.
Anderson Coup. & Fire Sup. Co.

Chemicals for Water Purification.
Arnold, Hoffman & Co.
Bush-Beach & Gent.
Electric Ozone Sterilizer Co.
Electro Bleaching Gas Co.
General Filtration Co.
Great Western Electro Chem. Co.
Pennsylvania Salt Mfg. Co.
Wallace & Tiernan Co., Inc.

Coal Tar.
Barrett Co., The.
Carey Co., Philip.

Cold Storage and Refrigeration Systems.
Spray Engineering Co.

Concrete Culverts.
Storms Mfg. Co.

Concrete Lighting Standards.
Chicago Concrete Post Co.

Concrete Mixers.
Jaeger Machine Co.
Worthington Pump & Mach. Corp.

Conduit Rods.
Bond & Co., Harold L.
Turbine Sewer Machine Co.

Conduits.
Fibre Conduit Co.

Contractors' Equipment.
Austin-Western Road Machy. Co.
Baker Mfg. Co.
Bond Co., Harold L.
Connery & Co., Inc.
Garford Motor Truck Co.
General Motors Truck Co.
Good Roads Machinery Co.
Littleford Bros.
Packard Motor Car Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.
Universal Road Machinery Co.

Contractors for Water Main Cleaning.
National Water Main Cleaning Co.

Culverts.
American Cast Iron Pipe Co.
Casey-Hedges Co.
Dee, Wm. E., Co.
Good Roads Machinery Co.
Newport Culvert Co.
Truscon Steel Co.
Storms Mfg. Co.
U. S. Cast Iron Pipe & Foundry Co.
Wood & Co., R. D.

Curb Bar.
Baker Co., R. D.
Truscon Steel Co.

Curb Boxes.
Casey-Hedges Co.
Clark Co., H. W.
East Iron & Machine Co.
Modern Iron Works.
S. E. T. Valve & Hydrant Co.

Current Meters.
Westinghouse Electric & Mfg. Co.

Derricks.
Taylor Portable Steel Derrick Co.

Drawing Instruments and Supplies.
Economy Drawing Table Co.
Kolesch & Co.

Dump Carts and Wagons.
Austin-Western Road Machy. Co.
General Motors Truck Co.
Watson Wagon Co.

Dumping Wagon Bodies.
Austin-Western Road Machy. Co.

Continued on page 90

A Culvert Pipe for City Use

THIS type of culvert pipe is particularly well adapted to city use. The half-round sections are made in two-foot lengths and whenever a pipe becomes clogged it's an easy matter to dig down and lift the section immediately above where the clogged condition exists, clean out and replace with absolutely no necessity of interfering with traffic nor the expense of digging up the whole pipe.

NEWPORT CULVERT CO., Inc.

NEWPORT, KY.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 98

Dust Laying Compounds.
Barrett Mfg. Co.
Dustoline for Roads Co.
Semet-Solvay Co.
Standard Oil Co.

Electric Current Meters.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Generators and Motors.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Lamp Fixtures.
Cutter Co., George.
Electric Railway Equipment Co.

Electric Lamps.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electrical Supplies.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Enameled Iron Signs.
Baltimore Enamel & Novelty Co.

Engineers' and Surveyors' Instruments.
Buff & Buff Mfg. Co.
Kolesch & Co.

Engineers, Consulting.
Albright & Mebus.
Alvord, John W., & Brudick, Chas.
Ballard & Co., F. W.
Black & Veatch.
Blanchard, A. H.
Burns & McDonnell.
Caird, James M.
Chester & Fleming.
Cravath, J. R.
Crosby, W. W.
Duluth Engineering Co.
Dunham-Clarin Co.
Flood, Walter H.
Fuller & McClintock.
Gannett, Seelye & Fleming.
Greeley, Samuel A.
Gregory, John H.
Harding, James.
Hazen, Whipple & Fuller.
Hering, Rudolph.
Higgins, J. Wallace.
Hopkins, Charles C.
Jennings, Lawrence & Lindsey.
Johnson, Geo. A.
Knowles, Morris.
Leavitt, Chas. W.
Ludlow, J. L.
McCrary Co., J. B.
Minnesota Engineering Co.
Mitchell, Hugh C.
Pollock, Clarence D.
Potter, Alexander.
Potts, Clyde.
Scofield Engineering Co.
Utilities Engineering Co.
Warren Engineering Co.

Engine, Gas. (See Gas Engines.)

Exhibition Material
Educational Exhibition Co.

Expansion Joint Material.
Barrett Mfg. Co.
Carey Co., Philip.
Pioneer Asphalt Co.
Truscon Steel Co.

Fencing.
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Co.
Wright Wire Co.

Fertilizers.
Dreer, Henry A.

Filing Cabinets.
Ecomony Drawing Table Co.

Filters-Feed Water.
Pittsburgh Filter Mfg. Co.

Filtros for Sewage Treatment
General Filtration Co.

Filtration Plants.
N. Y. Continental-Jewell Filtra. Co.
Norwood Engineering Co.
Pittsburgh Filter Mfg. Co.

Fire Alarm Cables.
Simplex Wire & Cable Co.

Fire Alarm Signals, Steam.
Union Water Meter Co.

Fire Alarm Systems.
Anderson Coupling & Fire Sup. Co.
Gamewell Fire Alarm Telegraph Co.
Loper Fire Alarm Co.

Fire Department Apparatus.
American-LaFrance Fire Engine Co.
Anderson Coupling & Fire Sup. Co.
Couple-Gear Freight-Wheel Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
South Bend Motor Car Works.
White Co., The.

Fire Department Supplies.
Anderson Coupling & Fire Sup. Co.

Fire Escapes.
Barnum Iron Works, E. T.

Fire Extinguishers, Chemical.
American-LaFrance Fire Engine Co.
Anderson Coupling & Fire Sup. Co.

Fire Hose.
Anderson Coupling & Fire Sup. Co.
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

Fire Pumps.
Worthington Pump and Machinery Corporation.

Flag Poles.
Barnum Iron Works, E. T.

Flexible Joints.
U. S. Cast Iron Pipe & Fdry. Co.

Flower Bed Guards.
Barnum Iron Works, E. T.
Wright Wire Co.

Fountains.
Barnum Iron & Wire Works, E. T.
Casey-Hedges Co.
Mott Iron Works, J. L.
Puro Sanitary Drinking Foun. Co.
Rundle-Spence Mfg. Co.
Stewart Iron Works Co.

Furnaces, Melting.
Leadite Co.
Modern Iron Works.

Garbage Cans—See Cans for Ashes and Garbage.

Garbage Wagons.
Austin-Western Road Machy. Co.
Garford Motor Truck Co.
General Motors Truck Co.
Packard Motor Car Co.
Watson Wagon Co.
White Co., The.

Gas Engines.
Bruce-Macbeth Engine Co.
Westinghouse Electric & Mfg. Co.
Worthington Pump & Mach. Corp.

Gaskets.
Leadite Co.

Gas Meters.
General Electric Co.
Pittsburgh Meter Co.

Gasoline Pumping Engines.
Bond Co., Harold L.
Modern Iron Works.
Worthington Pump & Mach. Corp.

Gasoline Storage Tanks.
Bowser & Co., Inc., S. F.

Gates For Parks and Cemeteries.
Barnum Iron Works, E. T.
Enterprise Iron Works.
Stewart Iron Works Company.
Wright Wire Co.

Gauges—Surface, Reservoir and Special Water Works.
Clark Co., H. W.

Graders.
Austin-Western Road Machy. Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Graphite.
Dixon Crucible Co., Joseph.

Grass Seed.
Burpee Co., W. Atlee.
Dreer, Henry A.
Thorburn & Co., J. M.

Health and Amusement Devices.
American Playground Device Co.
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.
Noll Bros.

Heating Kettles.
Connery & Co., Inc.

High Pressure Hydrants.
Smith Co., A. P.

Hitching Posts.
Barnum Iron & Wire Works, E. T.
Casey-Hedges Co.

Hose.
Anderson Coupling & Fire Sup. Co.
Bi-Lateral Fire Hose Co.
Fabric Fire Hose Co.
Goodrich Co., B. F.
Republic Rubber Co.

House Numbers.
Baltimore Enamel & Novelty Co.
Buffalo Municipal Equipment Co.

Hydrants.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Mfg. Co.
Norwood Engineering Co.
Pratt & Cady, Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
Wood & Co., R. D.

Indicator Posts.
Columbian Iron Works.
Flower-Stephens Mfg. Co.
Ludlow Valve Mfg. Co.
Pratt & Cady, Inc.
Rensselaer Valve Co.

Insulating Materials.
Carey Co., Philip.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Insulated Wire and Cable.
General Electric Co.
Simplex Wire & Cable Co.

Iron Collapsible Forms For Moulding Concrete.
Storms Mfg. Co.

Jail Cells and Jail Work.
Barnum Iron Works, E. T.

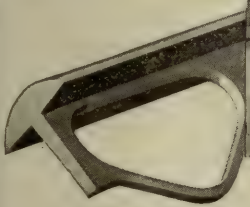
Joints, Flexible.
Coldwell-Wilcox Co.

Kahn Armour Plates.
Truscon Steel Co.

Continued on page 92

BACK OF THE PERFECT CURBING ARE KAHN CURB BARS

They provide the best and most economical method of protecting and reinforcing concrete curbing for either business or residential streets. There is no separating or splitting of the concrete at the corners, on account of the open spaces in the anchorage, which is absolutely positive.



Kahn Curb Bars are manufactured from special rolled steel sections, and are heavily galvanized after forming. They are furnished in either straight or curved bars and provide a protection of 1⅝ inches. Standard lengths 8, 10 and 12 feet.

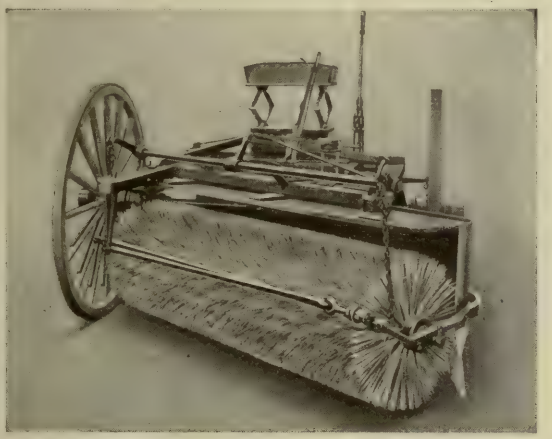
TRUSCON STEEL COMPANY

(FORMERLY TRUSSED CONCRETE STEEL CO.)

YOUNGSTOWN, OHIO.

WAREHOUSES AND REPRESENTATIVES IN PRINCIPAL CITIES

TRUSCON STEEL CO. TRUSCON BUILDING PRODUCTS



Clean Streets

In order to have and maintain clean, "dustless" streets, the use of a strong, durable street sweeper is essential. The Reliance Sweeper has won fame throughout the country as THE sweeper

Sweeps clean any kind of pavement. Simple in construction—simple to operate. Made of the best materials.

Effectiveness, Strength and Durability are its Main Features.

WRITE FOR ILLUSTRATED BOOKLET

THE UNIVERSAL ROAD MACHINERY CO.

KINGSTON, N. Y.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 98

Kettles, Tar and Asphalt.
Connery & Co., Inc.

Landscape Architects.
Arnold, Sheffield A.
Cole, Louis S.
Cowell, Arthur W.
Cullen, Wm. E.
Davey Tree Expert Co.
Hare & Hare.
Helder, Arthur H.
Higgins, J. Wallace.
Leavitt, Chas. W.

Lapidolith.
Sonneborn Sons, Inc., L.

Lawn Mowers.
Austin Western Road Machy. Co.
Manufacturers Distributing Co.
Milbradt Mfg. Co.
Pennsylvania Lawn Mower Works.
Shawnee Mower Co.

Lawn Sweepers and Sprinklers.
Buckner, W. A.
Everwear Mfg. Co.
Pennsylvania Lawn Mower Co.
Spray Engineering Co.

Lead Furnaces & Caulking Tools.
Modern Iron Works.
Smith, A. P.
Water Works Equipment Co.

Leadite.
Leadite Co.

Lead Wool.
United Lead Co.

Leak Finders.
Clark & Co., H. W.
Modern Iron Works.
Pitometer Co.
Water Works Equipment Co.

Liquid Chlorine.
Arnold, Hoffman & Co.
Bush-Beach & Gent.
Electro Bleaching Gas Co.
Great Western Electro Chem. Co.
Pennsylvania Salt Co.
Wallace & Tiernan Co., Inc.

Lighting Standards.
Casey-Hedges Co.
Chicago Concrete Post Co.
Cutter Co., George.
Electric Railway Equipment Co.
King Foundry Co.
Mott Iron Works, J. L.
Stewart Iron Works Co.

Lubricants.
Dixon Crucible Co., Joseph.

Lungmotors.
Life Saving Devices Co.

Manhole Covers.
Barnum Iron Works, E. T.
Casey-Hedges Co.
Clark Co., H. W.
Columbian Iron Works.
East Iron & Machine Co.
Modern Iron Works.
Mott Iron Works, J. L.
S. E. T. Valve & Hydrant Co.
U. S. Cast Iron Pipe & Foundry Co.
Wood & Co., R. D.

Merry-Go-Rounds.
American Playground Device Co.
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.

Metal Preservatives.
Dixon Crucible Co., Joseph.
Harrisons, Inc.

Meter Books.
Buffalo Meter Co.
Pittsburgh Meter Co.

Meter Boxes.
Buffalo Meter Co.
Casey-Hedges Co.
Clark Co., H. W.
Columbian Iron Works.
Ford Meter Box Co.
Hersey Mfg. Co.
McNutt, Lewis
Modern Iron Works.
Pittsburgh Meter Co.
S. E. T. Valve & Hydrant Co.

Meter Couplings.
Clark Co., H. W.
Ford Meter Box Co.
McNutt, Lewis
Modern Iron Works.
Pittsburgh Meter Co.

Meter Holding Devices.
Ford Meter Box Co.
McNutt, Lewis
Modern Iron Works.

Meter Testers.
Buffalo Meter Co.
Clark Co., H. W.
Ford Meter Box Co.
Neptune Meter Co.
Pittsburgh Meter Co.

Meters—See Water and Gas Meters.

Motor Trucks.
Couple-Gear Freight-Wheel Co.
General Motors Truck Co.
Garford Motor Truck Co.
Packard Motor Car Co.
White Co., The.

Motor Fire Apparatus—See Automobile Fire Apparatus.

Motor Truck Trailers.
Watson Wagon Co.

Municipal Auditors.
Bureau of Municipal Research.
Stander, Louis E.
Wolff, Mark.

Nurseries.
American Nursery Co.
Andorra Nurseries.
Bobbink & Atkins.
Donaldson Co.
Dreer, Henry A.
Harrison Nursery Co.
Hicks Nurseries.
Kohankie & Son, Henry.
Meehan Co., Thomas.
Smith Co., W. & T.
Storrs & Harrison Co.

Oil Tanks.
Connery & Co., Inc.

Ornamental Metal Fencing.
Barnum Iron & Wire Works, E. T.
Mott Iron Works Co., J. L.
Stewart Iron Works Co.
Wright Wire Co.

Packing.
Carey Co., Philip.

Paint Gun (Pneumatic).
Spray Engineering Co.

Park Management and Advice.
Benjamin E. Gage.

Park Benches.
American Playground Device Co.
Ashland Mfg. Co.
Barnum Iron & Wire Works, E. T.
Casey-Hedges Co.
Enterprise Iron Works.
Mott Iron Works, J. L.
Noll Brothers.
Stewart Iron Works Co.

Park and Lawn Sprinklers.
Penn. Lawn Mower Works.
Spray Engineering Co.

Park Swings.
Noll Brothers.

Paving Inspection.
Allentown Testing Laboratories.

Paving Machinery and Tools.
Erie Machine Shops
Warren Bros. Co.

Paving Materials. (See also under Brick and Cement.)
Barrett Co., The.
Carey Co., Philip.
Standard Oil Co.
Warren Bros. Co.

Paving Mixers.
Warren Bros. Co.
Worthington Pump and Machinery Corporation.

Paving Mixtures.
Standard Oil Co.

Pencils, Drafting, Office.
Dixon Crucible Co., Joseph.

Pipe.
American Cast Iron Pipe Co.
Casey-Hedges Co.
Cast Iron Pipe Pub. Bureau, R. C. McWane, Sec.
Central Foundry Co.
Clow & Sons, James B.
Donaldson Iron Co.
Glamorgan Pipe & Foundry Co.
Lynchburg Foundry Co.
Massillon Iron & Steel Co.
U. S. Cast Iron Pipe & Foundry Co
Warren Fdry. & Machine Co.
Wood & Co., R. D.
Zelnicker Supply Co., W. A.

Pipe Covering.
Carey & Co., Philip.

Pipe Cutters.
Smith Co., A. P.
Strickler & Bros., W. W.
Water Works Equipment Co.

Pipe Handling Machinery.
Taylor Portable Steel Derrick Co.

Pipe Joint Compound.
Dixon Crucible Co., Joseph.

Pipe Jointing Materials.
Leadite Co.
United Lead Co.
Water Works Equipment Co.

Pipe Locators.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co.

Pitch.
Barrett Co., The.
Carey Co., Philip.

Pitometers.
Pitometer Co., The.

Playground Apparatus.
American Playground Device Co.
Ashland Mfg. Co.
Everwear Mfg. Co.
George, Howard.
Hill-Standard Co.
Medart Mfg. Co., Fred.

Pneumatic Tools.
United Lead Co.

Continued on page 94

"Lafayette, Here We Are"

Through remote French villages resounds the unaccustomed tramp of American soldiers. But a little while ago and these men were in the quiet of their homes in a peaceful country. Today, in a strange land, they are facing the world's bloodiest struggle.

Pershing at the tomb of America's old time friend months ago reported, with true soldier eloquence, "Lafayette, here we are." And it is for us of the great American democracy to rally all our might to the support of our army and our allies.

From our shores to the battlefields of France are thousands of miles which must be bridged with ceaseless supplies to our troops. Every day calls for action here, no less than there. Cooperate! Sacrifice! These are the watchwords sent over the land by the Government.

In this national effort the Bell System has served with every other essential industry in order that communication, manufacture and transportation may be kept at the peak of efficiency to provide the munitions, ordnance and supplies so urgently needed.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
AND ASSOCIATED COMPANIES

One Policy *One System* *Universal Service*

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisements follows this classified list. See page 98

Poles, Combination Railway and Lighting.
Cutter Co., George.
Electric Railway Equipment Co.
Mott Iron Works, J. L.

Police Patrols.
General Motors Truck Co.
White Co., The.

Police Signal Cables.
Simplex Wire & Cable Co.

Police Signal Systems.
Gamewell Fire Alarm Telegraph Co.

Portable Derricks.
Taylor Portable Steel Derrick Co.

Portland Cement.
Pennsylvania Cement Co.

Powder.
DuPont de Nemours & Co., E. I.

Producers—Gas Power Plants.
Bruce-Macbeth Engine Co.
Westinghouse Electric & Mfg. Co.

Publishers.
Appleton & Co., D.
Engineering News-Record.
Wiley & Sons, John.

Pumping Machinery.
Bond Co., Harold L.
Deming Co.
Shone Co.
Wood & Co., R. D.
Worthington Pump and Mach. Corp.

Ramshorn Meter Holding Frame.
Ford Meter Box Co.

Reinforcing for Paving.
Truscon Steel Co.

Repair Lids for Service Boxes.
Clark Co., H. W.
Modern Iron Works.

Road and Street Machinery.
Austin-Western Road Machy. Co.
Baker Mfg. Co.
Buffalo-Springfield Roller Co.
Connery & Co., Inc.
Erie Machine Shops.
Garford Motor Truck Co.
The Good Roads Machinery Co.
Littleford Bros.
Newport Culvert Co.
Packard Motor Car Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.
Universal Road Machinery Co.
Warren Bros. Co.
White Co., The.

Road Binders.
Barrett Co., The.
Semet-Solvay Co.
Standard Oil Co.

Road Culverts.
Casey-Hedges Co.
Good Roads Machy. Co.
Newport Culvert Co.
Storms Mfg. Co.
U. S. Cast Iron Pipe & Fdry. Co.
Wood & Co., R. D.

Road Drag and Street Scrapers.
Austin-Western Road Machy. Co.
The Good Roads Machinery Co.
Newport Culvert Co.
Rochester Can Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Road Oil.
Barrett Co., The.
Dustoline for Roads Co.
Standard Oil Co.

Road Oilers.
Austin-Western Road Machy. Co.
Etnyre & Co., E. D.
General Motors Truck Co.
Good Roads Machinery Co.
Universal Road Machinery Co.
White Co., The.

Road Rollers.
Austin-Western Road Machy. Co.
Buffalo Springfield Roller Co.
Erie Machine Shops.
Good Roads Machinery Co.

Rock Crushers.
Austin-Western Road Machy. Co.
Good Roads Machy. Co.
Universal Road Machinery Co.
Worthington Pump & Mach. Corp.

Roofing.
Barrett Co., The.
Carey Co., Philip.

Rubber Tires.—See Tires, Rubber.

Rubbish Burners.
Barnum Iron Works, E. T.

Rust Preventing Material.
Dixon Crucible Co., Jos.
Harrisons, Inc.

Safety Manhole Cover.
East Iron & Machine Co.

Sand Spreaders.
Buffalo Municipal Equipment Co.

Sanitary Drinking Fountains.
Barnum Iron Works.
Casey-Hedges Co.
Mott Iron Works, J. L.
Rundle-Spence Mfg. Co.
Stewart Iron Works Co.

Scarifiers.
Austin-Western Road Machy. Co.
Good Roads Machinery Co.
Newport Culvert Co.
Universal Road Machy. Co.

Seeds, Plants and Bulbs.
Burpee Co., W. Atlee.
Dreer, Henry A.
Hicks Nurseries.
Storrs & Harrison Co.
Thorburn & Co., J. M.

Service Boxes.
Casey-Hedges Co.
Clark Co., H. W.
Modern Iron Works.
Water Works Equipment Co.

Service Box Finders.
Clark Co., H. W.

Sewage Ejectors.
Otterson Auto-Eductor Co.
Shone Co.

Sewage Treatment.
General Filtration Co.

Sewer Basins.
Odorless Sewer Basin Co.

Sewer Buckets.
Champion Potato Machinery Co.

Sewer Castings.
Casey-Hedges Co.
Clark Co., H. W.
Dee Co., Wm. E.
Enterprise Iron Works.

Sewer Cleaning Apparatus.
Buffalo Municipal Equipment Co.
Champion Potato Machinery Co.
Turbine Sewer Machine Co.

Sewer Jacks.
Ashland Mfg. Co.

Sewer Pipe.
Dee Co., Wm. E.

Sewer Rods.
Bond Co., Harold L.
Champion Potato Machinery Co.
Turbine Sewer Machine Co.

Sheer Gates.
Chapman Valve Mfg. Co.
Columbian Iron Works.
Rensselaer Valve Co.

Signs—Iron and Wire.
Barnum Iron Works, E. T.
Buffalo Municipal Equipment Co
Early, Jos. N.
Lebanon Iron & Machine Co.
Mathews Interlocking Sign Co.
Union Iron Products Co.

Sleeves and Valves.
Flower-Stephens Mfg. Co.
Rensselaer Valve Co.

Sluice Gates and Valves.
Chapman Valve Mfg. Co.
Coldwell-Wilcox Co.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Rensselaer Valve Co.

Snow Cleaning Machinery.
Good Roads Machinery Co
Russell Grader Mfg. Co.

Snow Plows.
Baker Mfg. Co.
Good Roads Machinery Co.
Newport Culvert Co.
Russell Grader Mfg. Co.

Soil Pipe (Cast Iron).
Abendroth Bros.
Alabama Pipe & Foundry Co.
American Enameling Mfg. Co.
American Foundry & Pipe Co.
Anniston Foundry Co.
Bessemer Soil Pipe Co.
Campbell Mfg. Co.
Casey-Hedges Co., The.
Central Foundry Co.
Charlotte Pipe and Foundry Corp
Coosa Pipe & Foundry Co.
Crown Pipe and Foundry Co.
Gadsden Pipe Co.
Haines, Jones & Cadbury Co.
Johnson Co., J. D.
Krupp Foundry Co.
Medina Foundry Co.
National Pipe & Fdry. Co.
Reading Foundry & Supply Co.
Salem Brass & Iron Mfg. Co.
Sanitary Co. of America.
Somerville Iron Works, The.
Standard Foundry Co.
Superior Mfg. Co.
Union Foundry Co.
Weiskittel & Son Co., A.
Wetter Mfg. Co., H.

Spiral Riveted Pipe.
Casey-Hedges Co.

Spraying Machinery for Trees an Shrubs.
Deming Co.

Spray Nozzles.
Spray Engineering Co.

Continued on page 96

THE STANDARD METHOD of SURFACE TREATMENT

Below is a water bonded Gravel Road treated with Stanolind Paving Asphalt at 300°F., 45 pounds pressure, applied one-half gallon to the square yard by special pressure tank wagon shown in other illustration.

One application of Stanolind Paving Asphalt on Macadam and Gravel Roads has given three years' service with practically no expense. Builds more substantial surface at half the cost of light oil treatment for three years. Can be applied on roads previously treated with Road Oil.

Write today for free booklet, "Stanolind Paving Asphalt."

STANDARD OIL COMPANY
(INDIANA)

72 W. Adams Street, Chicago, Ill.

UNIFORMITY

is a prime requisite of WARRENITE—The Country Road Surface, and is safeguarded by systematic testing to insure the highest standard possible in the mixture of

WARRENITE Road Surface

These tests are made by expert chemists of real authority.

Now in time of war county officials should not spend money experimenting—their efforts should be directed toward a standard surfacing which has already stood the test as to motor transportation and varying climatic conditions as has

WARRENITE

Trunk line highways are necessary to relieve the overburdened railroads of the freight congestion.

Highways should be encouraged and built at once. Never were they more needed than at the present time

BUT

these highways should be built of a material which will give you a well paved highway for years to come.

Insist on
WARRENITE
The Ideal Country Road Surface
All to gain—Nothing to Lose

Write today for WARRENITE circulars, specifications, and form of mixture agreement available to all contractors and learn more about this modern ideal country road surface. **It is to your advantage.**

Warrenite, Rockrimmon Road, near Chicopee, Mass.

WARREN BROTHERS COMPANY

Executive Offices: Boston, Mass.

District Offices:

New York, N. Y.
San Francisco, Cal.
Richmond, Va.
St. Louis, Mo.
Chicago, Ill.
Portland, Ore.
Nashville, Tenn.
Winnipeg, Man.
Los Angeles, Cal.
Phoenix, Ariz.
Utica, N. Y.
Montreal, P. Q.
Toronto, Ont.
Vancouver, B. C.

Every name in this list is represented by an advertisement in this issue of THE AMERICAN CITY. The alphabetical index to all advertisers follows this classified list. See page 98

Standpipes.
Casey-Hedges Co.
Connery & Co., Inc.
Wood & Co., R. D.

Steel Derricks.
Taylor Portable Steel Derrick Co.

Street Cleaning Machines (Motor Driven).
Elgin Sales Co.
Garford Motor Truck Co.
General Motors Truck Co.
White Co., The.

Street Flushers.
Buffalo Municipal Equipment Co.
Etnyre & Co., E. D.
Garford Motor Truck Co.
General Motors Truck Co.
White Co., The.

Street Lamps—Electric.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Street Lamp Posts.
Barnum Iron Works, E. T.
Casey-Hedges Co.
Chicago Concrete Post Co.
Cutter Co., George.
Electric Railway Equipment Co.
King Foundry Co.
Mott Iron Works, J. L.
Stewart Iron Works Co.

Street and Road Graders.
Austin-Western Road Machy. Co.
Good Roads Machy. Co.
Russell Grader Mfg. Co.
Spaulding Mfg. Co.

Street and Road Signs.
Baltimore Enamel & Novelty Co.
Buffalo Municipal Equipment Co.
Early, Jos. N.
Lebanon Iron & Machine Co.
Mathews Interlocking Sign Co.
Union Iron Products Co.

Street Sign Posts.
Casey-Hedges Co.
Cutter Co., George.
Early, Jos. N.
Lebanon Iron & Machine Co.
Mott Iron Works, J. L.

Street Sprinklers.
Austin-Western Road Machy. Co.
Buffalo Municipal Equipment Co.
Etnyre & Co., E. D.
Garford Motor Truck Co.
General Motors Truck Co.
Water Works Equipment Co.
White Co., The.

Street Sweepers.
Austin-Western Road Machy. Co.
Elgin Sales Co.
Universal Road Machinery Co.

Street Trash Cans.
American Can Co.
Butler Mfg. Co.
Rochester Can Co.

Surveyors Instruments.
Buff & Buff Co.
Kolesch & Co.

Tanks, Storage for Oils and Gasoline.
Bowser & Co., Inc., S. F.
Connery & Co., Inc.

Tanks and Towers.
Casey-Hedges Co.
Newport Culvert Co.
Wood & Co., R. D.
Zelnicker Supply Co., W. A.

Tapping Machines.
Smith Co., A. P.
Water Works Equipment Co.

Tar.
Barrett Co., The.

Tar & Asphalt Spreaders.
White Co., The.

Tar Kettles.
Casey-Hedges Co.
Connery & Co., Inc.
Good Roads Machinery Co.
Littleford Bros.
Warren Bros. Co.

Tar Wagons.
Casey-Hedges Co.

Tarvia.
Barrett Co., The.

Testing Laboratories.
Allentown Testing Laboratory Co.

Tires, Rubber.
Dayton Rubber Mfg. Co.
Firestone Tire & Rubber Co.
Fisk Rubber Co.
Goodrich Co., B. F.
Republic Rubber Corp.
U. S. Tire Co.

Traction Engines.
Buffalo Springfield Roller Co.

Traction Trains.
Buffalo Springfield Roller Co.

Tractors.
American-La France Fire Engine Co.
Garford Motor Truck Co.
General Motors Truck Co.
Watson Wagon Co.
White Co., The.

Traffic Posts.
Buffalo Municipal Equipment Co.
Chicago Concrete Post Co.
George Cutter Co.
Lebanon Iron & Machine Co.

Traffic Regulation Signs.
Baltimore Enamel & Novelty Co.
Buffalo Municipal Equipment Co.
Early, Jos N.
Lebanon Iron & Machine Co.
Union Iron Products Co.

Trailers.
Buffalo Springfield Roller Co.
Watson Wagon Co.

Tree and Flower Bed Guards.
Mott Iron Works, J. L.
Wright Wire Co.

Trench Braces.
Bond Co., Harold L.

Trench Pumps.
Bond Co., Harold L.
Deming Co.
Modern Iron Works.
Water Works Equipment Co.
Worthington Pump & Mach. Corp.

Turbines.
Westinghouse Electric & Mfg. Co.

Vacuum Pumps.
Deming Co.
Worthington Pump & Mach. Corp.

Valves.
Ashland Mfg. Co.
Chapman Valve Mfg. Co.
Coldwell-Wilcox Co.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Pratt & Cady Co., Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
Water Works Equipment Co.
Wood & Co., R. D.

Valve Boxes and Housings.
Casey-Hedges Co.
Clark Co., H. W.
Columbian Iron Works.
Eddy Valve Co.
Flower-Stephens Mfg. Co.
Ludlow Valve Co.
Modern Iron Works.
Pratt & Cady Co., Inc.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
U. S. Cast Iron Pipe & Foundry Co.
Wood & Co., R. D.

Valve Inserting Machinery.
Smith Co., A. P.

Valve Seats.
Wood & Co., R. D.

Valve Specialties.
Chapman Valve Mfg. Co.
S. E. T. Valve & Hydrant Co.

Wagons and Carts.
Watson Wagon Co.

Water Works Conservation.
National Water Main Cleaning Co
Pitometer Co.
Water Works Equipment Co.

Water Main Cleaning.
National Water Main Cleaning Co

Water Meters.
Badger Meter Mfg. Co.
Buffalo Meter Co.
General Electric Co.
Hersey Mfg. Co.
Neptune Meter Co.
Pittsburgh Meter Co.
Thomson Meter Co.
Union Water Meter Co.
Worthington Pump & Mach. Corp.

Waterproofing.
Barrett Mfg. Co.
Carey Co., Philip.
Minwax Co.
Sonneborn Sons, Inc., L.
Truscon Steel Co.

Water Purification Chemicals.
See Chemicals for Water Purification.

Water Regulators.
Modern Iron Works.
Union Water Meter Co.

Water Towers.
Casey-Hedges Co.

Water Works Specialties.
Casey-Hedges Co.
Chapman Valve Mfg. Co.
Clark Co., H. W.
Flower-Stephens Mfg. Co.
Leadite Co.
Minwax Co.
Modern Iron Works.
Pittsburgh Filter Co.
Rensselaer Valve Co.
S. E. T. Valve & Hydrant Co.
Smith Co., A. P.
Strickler & Bros., W. W.
Union Water Meter Co.
United Lead Co.
Warren Fdry. & Machine Co.
Water Works Equipment Co.

Well Construction & Equipment
Clark Co., H. W.

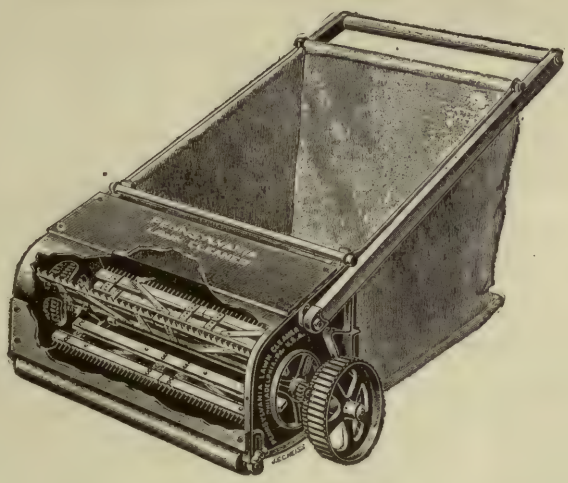
Wheel Scrapers.
Austin-Western Road Machy. Co.
Good Roads Machinery Co.

Wire and Cable.
General Electric Co.
Simplex Wire & Cable Co.

Wire-Cut-Lug Brick.
Metropolitan Paving Brick Co.
Southern Clay Mfg. Co.

Wood Preservatives.
Barrett Co., The.
Republic Creosoting Co.

PENNSYLVANIA
Quality
LAWN CLEANER & RAKE



The "PENNSYLVANIA" Lawn Cleaner and Rake picks up all grass cuttings, leaves, trash and litter right down to the ground.

Does the work of four men with hand rakes in the same time and does it better.

Assists growth of grass, leaving it standing upright and free of all foreign matter.

This labor-saving cleaner is a big economy in the necessary care of large lawns, public parks, cemeteries and golf greens.

The "PENNSYLVANIA" Lawn Cleaner and Rake measures up to the high standards in *quality* and efficiency set by the famed "PENNSYLVANIA" *Quality* Lawn Mowers.

Sold by Hardware Dealers and Seedsmen.

PENNSYLVANIA LAWN MOWER WORKS
ORIGINAL
JOHN BEALL & SONS
FOUNDED 1877 PHILADELPHIA

This trade mark is on the handles of:

"Pennsylvania"
"Pennsylvania, Jr."
"Pennsylvania Golf"
"Pennsylvania Putting Greens Mower"
"Continental"
"GreatAmericanB.B."
"Shock Absorber"
"Quaker City"
"Red Cloud B. B."
"Orchid B. B."
"Daisy"
"New Belmont"
"Bellevue"
"Panama"
"Delta B. B."
"Electra"
"Pennsylvania Pony"
"Pennsylvania Horse"
"Pennsylvania Grand Horse"
"Pennsylvania Trio Horse" (86 in. cut)

Index to Advertisers in this Issue of The American City

Abendroth Bros. 21
Alabama Pipe & Foundry Co. 21
Albright & Mebus 79
Allentown Testing Laboratory Co. 79
Alvord, J. W., & C. B. Burdick 79
American Can Co 68
American Cast Iron Pipe Co. 24
American City Bureau 56
American Enameling Mfg. Corp. 21
American Foundry & Pipe Co. 21
American-LaFrance Fire Eng. Co. 49
American Nursery Co 76
American Playground Device Co. 63
American Telephone & Tel. Co. 93
Anderson Coup. & Fire Supply Co. 53
Andorra Nurseries 78
Anniston Foundry Co 21
Appleton & Co., D 70
Arnold, Hoffman & Co 28
Arnold, Sheffield, A 79
Arnold & Tripp 79
Ashland Mfg. Co 61
Austin Western Road Mach'y Co. 95

Badger Meter Mfg. Co 18
Baker Co., R. D 82
Baker Mfg. Co 81
Ballard & Co., F. W 81
Baltimore Enamel & Novelty Co. 58
Barnum Iron Works, E. T 59
Barrett Co., The 44
Bessemer Soil Pipe Co 21
Bi-Lateral Fire Hose Co 52
Black & Veatch 79
Blanchard, Arthur H 79
Bobbink & Atkins 76
Bond Co., Harold L 86
Bowser & Co., Inc., S. F 50
Bruce-Macbeth Engine Co 33
Buckner, W. A 78
Buff & Buff Mfg. Co 85
Buffalo Meter Co 30
Buffalo Municipal Equip. Co 60
Buffalo Springfield Roller Co 84
Bureau of Municipal Research 57
Burns & McDonnell 79
Burpee & Co., W. Atlee 75
Bush-Beach-Gent 24
Butler Mfg. Co 74

Caird, James M 79
Campbell Mfg. Co 21
Carey Co., Philip 4-5
Casey-Hedges Co 57
Cast Iron Pipe Pub. Bureau 12-13
Central Foundry Co 21-25
Champion Potato Machinery Co. 27
Chapman Valve Mfg. Co 83
Charlotte Pipe and Foundry Co. 21
Chelsea Hotel 83
Chester & Fleming 79
Chicago Concrete Post Co 83
Clark Co., H. W 30
Coldwell-Wilcox Co 26
Cole, L. S 79
Columbian Iron Works Co 31
Connery & Co., Inc 86
Coosa Pipe & Foundry Co 21
Couple-Gear Freight Wheel Co 53
Cravath, J. R 79
Crown Pipe & Foundry Co 21
Cullen, Wm. F 79
Cutter, Geo., Co 99

Davey Tree Expert Co 77
Dayton Rubber Mfg. Co 52
Dee Co., Wm. E 24
Deming Co., The 26
Dixon Crucible Co., Joseph 81
Donaldson Co. (Willadean Nurs.) 76
Dreer, Henry A 77
Duluth Engineering Co 79
Dunham-Clarin Co., F. A 79
Du Pont Powder Co 37
Dustoline for Roads Co 78

Early, Jos. N 55
East Iron & Machine Co 30
Economy Drawing Table Co 67
Eddy Valve Co 31
Educational Exhibition Co 73

Eggert Chemical Co 59
Electric Ozone Sterilizer Co 32
Electric Railway Equipment Co. 43
Electro Bleaching Gas Co 29
Elgin Sales Co 59
Engineering News-Record 40
Enterprise Iron Works 77
Erie Machine Shops 84
Etnyre & Co., E. D 84
Everwear Mfg. Co 8-9

Fabric Fire Hose Co 54
Fibre Conduit Co 81
Firestone Tire & Rubber Co 48
Fisk Rubber Co 100
Flood, Walter H 79
Flower-Stephens Mfg. Co 33
Foos Gas Engine Co 27
Ford Meter Box Co 23
Framingham Nursery Co 76
Fuller & McClintock 79

Gadsden Pipe Co 21
Gage, Benj. E 73
Gamewell Fire Alarm T. Co 53
Gannett, Seelye & Fleming 79
Garford Motor Truck Co 46
General Electric Co 2-39
General Filtration Co 32
General Motors Truck Co 45
George, Howard 57
Goodrich Rubber Co., B. F 6-7
Good Roads Mach'y Co 85
Great Western Electro Chem. Co. 24
Greeley, Samuel A 79
Gregory, John H 79

Haines, Jones & Cadbury Co 21
Hansen, A. E 79
Harding, James 80
Hare & Hare 80
Harrison Nursery Co 77
Hazen, Whipple & Fuller 80
Helder, Arthur H 80
Hering, Rudolph 80
Hersey Manufacturing Co 28
Hicks Nurseries 74
Higgins, J. Wallace 80
Hill-Standard Co 62
Hopkins, Chas. C 80

Jacobs J. L 80
Jaeger Machine Co 82
Jennings, Lawrence & Lindsey 80
Johnson Co., J. D 21
Johnson, Geo. A 80

King Foundry Co 55
Knowles, H. C 80
Kohankie & Son, Henry 77
Kolesch & Co 85
Krupp Foundry Co 21

Leadite Co., The 31
Leavitt, Chas. W 80
Lebanon Machine Co 55
Lewis & Valentine 77
Life Saving Devices Co 53
Littleford Bros 85
Loper Fire Alarm Co 53
Ludlow, J. L 80
Ludlow Valve Mfg. Co 28
Lynchburg Foundry Co 24

McNutt, Lewis 31
Manufacturers Dist. Co 59
Martinique Hotel 54
Mathews Interlocking Sign Co 55
Medart Mfg. Co., Fred 63
Medina Foundry Co 21
Meehan Co., Thos. B 75
Meehan, Thos., & Sons 80
Metropolitan Pav. Brick Co., The 55
Milbradt Mfg. Co 60
Minwax Co 30
Mitchell, Hugh C 80
Modern Iron Works 28
Mott Iron Works, J. L 60

National Pipe & Foundry Co 21
National Water Main Cleaning Co. 20
Neptune Meter Co 10-11

Newport Culvert Co 89
N.Y. Contin'l Jewell Filtration Co. 83
Noiseless Typewriter Co 72
Noll Bros 73
Norwood Engineering Co 33

Odorless Sewer Basin Co 16
Otterson Auto-Eductor Co 69

Packard Motor Car Co 47
Parker Pen Co 67
Pennsylvania Cement Co 86
Penn. Lawn Mower Works 97
Pennsylvania Salt Mfg. Co 27
Pioneer Asphalt Co 54
Pitometer Co 22
Pittsburgh Filter Mfg. Co 29
Pittsburgh Meter Co 33
Pollock & Taber 80
Potter, Alexander 80
Potts, Clyde 80
Pratt & Cady Co., Inc 24
Puro Sanitary Drinking Foun. Co. 57

Reading Foundry & Supply Co 21
Rensselaer Valve Co 32
Republic Creosoting Co 81
Republic Rubber Corporation 85
Rigamount, Victor A 80
Rochester Can Co 73
Rotarian, The 71
Rundle-Spence Mfg. Co 65
Russell Grader Mfg. Co 85

Salem Brass & Iron Mfg. Co 80
Sanitary Co. of America 80
Scofield Engineering Co 81
Semet-Solvay Co 87
S. E. T. Valve & Hydrant Co 31
Shawnee Mower Co 74
Sherman, LeRoy K 80
Shone Co 33
Simplex Wire & Cable Co 61
Smith Co., A. P 33
Smith Co., W. & T 77
Somerville Iron Works, The 21
Sonneborn Sons, Inc., L 68-69
Southern Clay Mfg. Co 84
Spaulding Mfg. Co 83
Spray Engineering Co 69
Standard Foundry Co 21
Standard Oil Co 95
Stander, Louis E 80
Stewart Iron Works Co 74
Storms Mfg. Co 84
Storrs & Harrison Co 75
Strickler & Bros., W. W 30
Superior Mfg. Co 21
Survey, The 78

Taylor, Henry W 81
Taylor Portable Steel Derrick Co. 82
Thomson Meter Co 29
Thorburn & Co., J. M 75
Truscon Steel Co 91
Turbine Sewer Mch. Co 14
Twogood, L. Scott 80

Union Foundry Co 21
Union Iron Products Co 55
Union Water Meter Co 51
United Lead Co 31
U. S. Cast Iron Pipe & Fdy. Co 3
United States Tire Co 52
Universal Road Machinery Co 91

Waddell & Son 81
Wallace & Tiernan Co., Inc 17
Warren Engineering Co 81
Warren Bros. Co 86
Warren Foundry & Machine Co. 27
Water Works Equipment Co 32
Watson Wagon Co 35
Weiskittel & Son Co., A 21
Westinghouse Elec. & Mfg. Co 15
Wetter Mfg. Co., H 21
White Co., The 42
Wiley & Sons, John 66
Wolff, Mark 81
Wood & Co., R. D 26
Worthington Pump & Mch. Corp. 19
Wright Wire Co 65

Zelnicker Supply Co., W. A 59

Save $9.00 Per Post Annually In Maintenance Cost By Changing The Tops Of Cluster Posts To Single Light

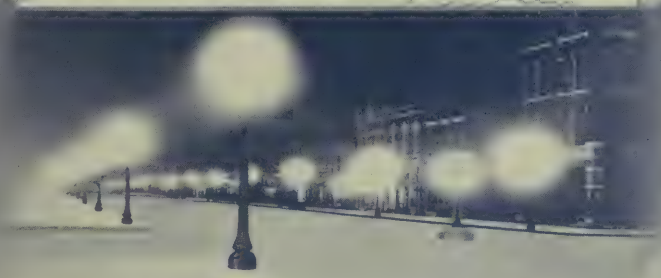
COST SAVED IN SIX MONTHS

CHANGE THIS TOP

TO THIS TOP

CUTTER

Modern Street Lighting Fixtures with Mazda "C" Lamps Conserve Coal-Labor-Freight and Maintenance



CONSERVE COAL

If the fifty thousand Cluster Posts in the United States were changed to single light using Mazda "C" Lamps, the saving in coal alone would amount to approximately forty thousand tons per year.

GEORGE CUTTER COMPANY

SOUTH BEND, INDIANA

CHICAGO
LOS ANGELES

DETROIT
SAN FRANCISCO

NEW YORK
SEATTLE

A BILLION DOLLARS, half a million workmen and houses for them to live in—2000 ships! These are the big figures of our 1918 ship-production program to help the Allies.

"There is now a Fisk Tire for every motor vehicle that rolls."

MATERIALS must reach the yards if *ships* ar houses for the workmen are to be built.

MOTOR TRUCKS, by relieving freight congestion, a doing wonders in the transportation of materials.

TO KEEP GOING, trucks must have dependable tir

FISK TRUCK TIRES are dependable, sturdy and stron They steadfastly meet any service demand put up them.

WHEN you need *dependable* solid tires—buy FISK.

FISK SOLID TIRES

1022M